AUG 14 1944

PAPER TRADE JOURNAL

AUGUST 10, 1944

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MIXERS

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Agitation

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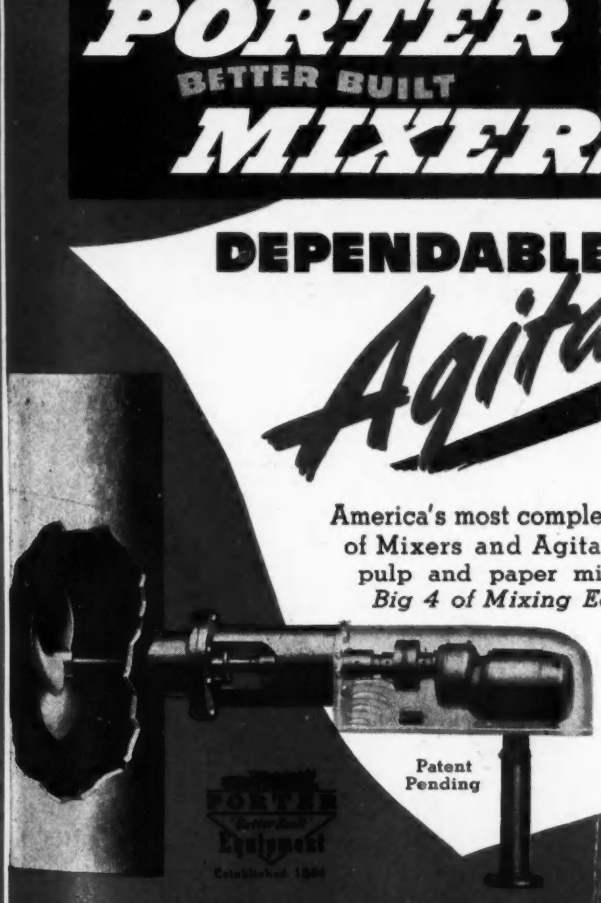

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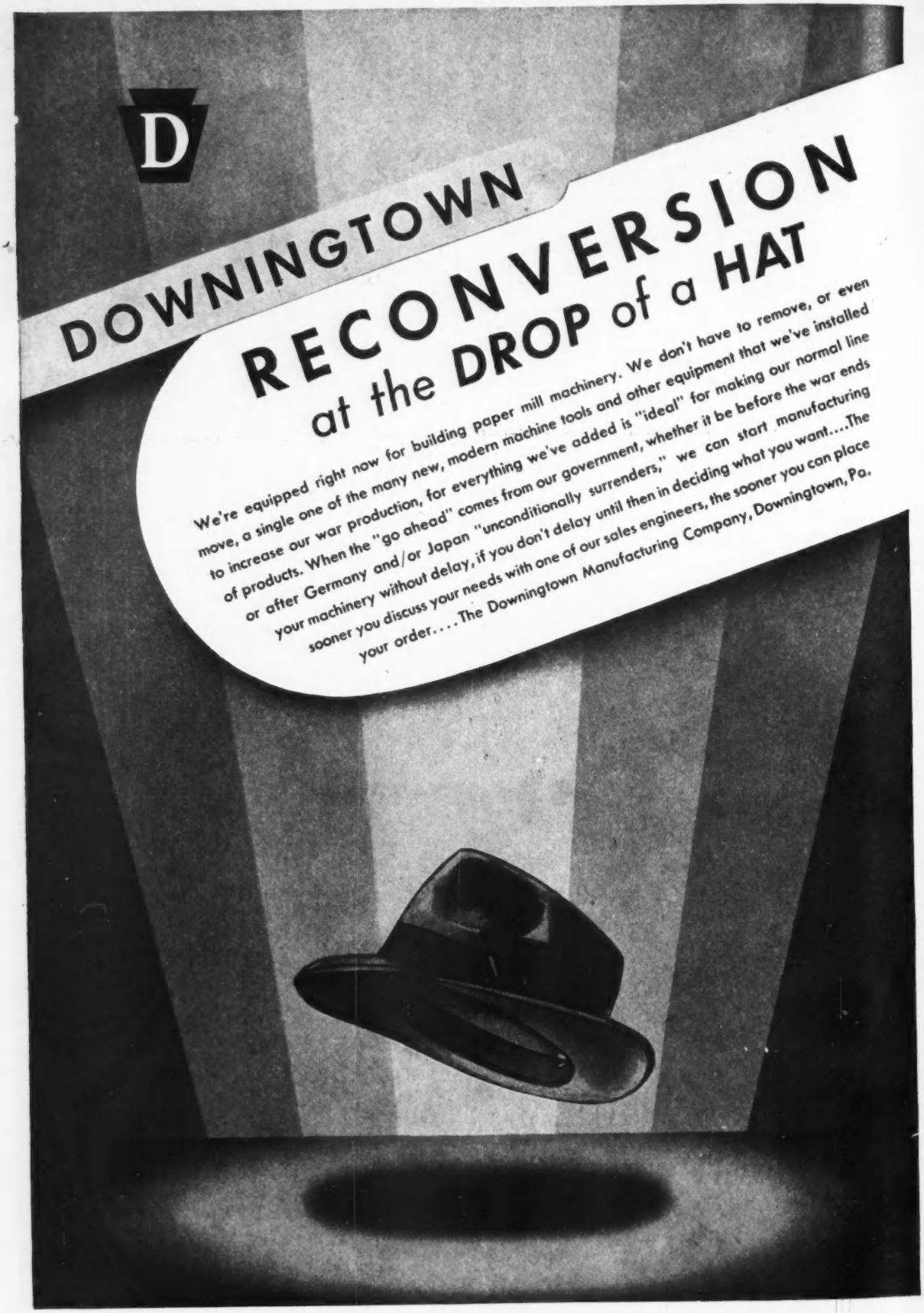
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DOWNINGTOWN
RECONVERSION
at the DROP of a HAT
We're equipped right now for building paper mill machinery. We don't have to remove, or even move, a single one of the many new, modern machine tools and other equipment that we've installed to increase our war production, for everything we've added is "ideal" for making our normal line of products. When the "go ahead" comes from our government, whether it be before the war ends or after Germany and/or Japan "unconditionally surrenders," we can start manufacturing your machinery without delay, if you don't delay until then in deciding what you want....The sooner you discuss your needs with one of our sales engineers, the sooner you can place your order....The Downingtown Manufacturing Company, Downingtown, Pa.

PAPER TRADE JOURNAL

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West Virginia Pulp and Paper Company

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New York

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Chicago

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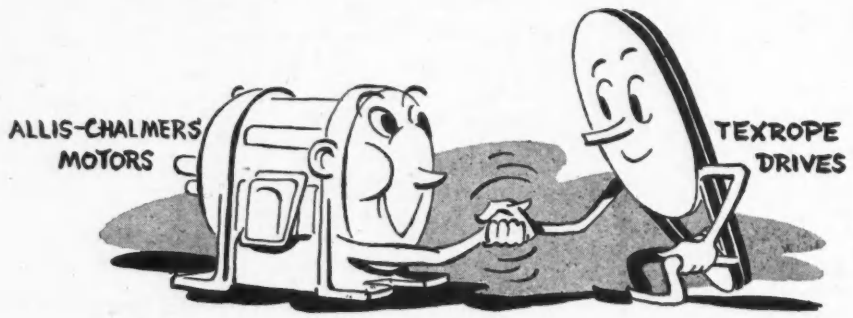
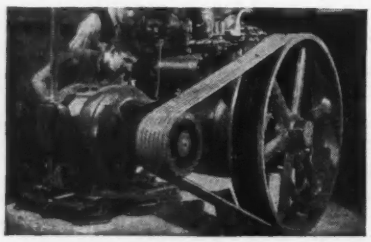
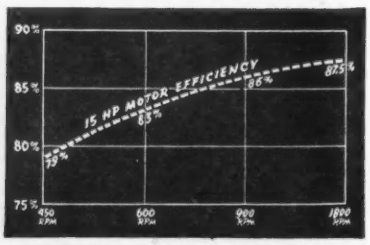


★ To drive low speed machinery with high speed motors (now that low speed motors are sharply restricted), Allis-Chalmers Texrope Drives can "gear down" motor speeds over a range of 7 to 1. As America's only builder of *both* motors and V-belt drives, Allis-Chalmers has long studied and advocated their use in proper com-



1 In most applications, an 1800 rpm motor with Texrope Drive will ably do the job of a lower-speed, direct-connected motor —at lower cost in money *and materials!*

2 When you buy an 1800 rpm instead of 450 rpm 15 hp squirrel-cage motor, for example, 600 lb are saved. And *you* save well over $200 — with drive figured in!



3 Note that efficiency rises from 79% for the 450 rpm motor to 87.5% for the 1800 rpm motor. The 1800 rpm motor saves you over 30 kw/24 hr. day.

WE WORK FOR VICTORY — WE PLAN FOR PEACE

ALLIS-

Vol. 119, No. 6

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

August 10, 1944

Mill Men Hold Round Table Discussion

Plant Executives and Mill Personnel In Three States Meet To Consider Post-War and Current Problems—Assesses Tolls On Wisconsin River — Four-Day Strike Ends — Other Late Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 7, 1944—About 40 plant executives and mill personnel members from Wisconsin, Michigan and Minnesota attended a one-day meeting here last Thursday.

The meeting was devoted to round table discussions of post-war and current problems of the pulp and paper manufacturing industry, and was the quarterly gathering of the Pulp and Paper Manufacturers Association. Sessions, starting at 9 o'clock in the morning, continued throughout the day at the Conway hotel. A noon luncheon was served.

About 55 mills in the three states are included in the membership.

Assesses Tolls Along Wisconsin River

The Wisconsin Valley Improvement Company, which has its offices at Wausau, Wis., has suggested to the Wisconsin State Public Service Commission that tolls of $115,166 be assessed against water power operators along the Wisconsin River for services during the first six months of this year.

The law requires the company to make semi-annual reports to the commission and to make recommendations for tolls sufficient to pay a net return of 7% yearly on the investment in the reservoir system. The commission will hold a hearing at Madison, Wis., August 8 to consider any objections to the tolls.

Tolls were recommended as follows:

Wisconsin Public Service Corporation: Eagle River Dam, $214; Hat Rapids Dam, $1,539; Jersey Dam, $474; Tomahawk Dam, $1,941; Grandfather Dam, $15,297; Alexander Dam, $3,616; Merrill Dam, $261; Wausau Dam, $4,445.

Rhinelander Paper Company; Rhinelander Dam, $2,136. Tomahawk Pulp Company: King's Dam, $1,710. Tomahawk Kraft Paper Company: Grandmother Dam, $3,122. Marathon Corporation: Rothschild Dam, $3,372. Mosinee Paper Mills Company: Mosinee Dam, $2,730.

Consolidated Water Power and Paper Company: DuBay Dam, $8,184; Stevens Point Dam, $5,694; Biron Dam, $7,834; and Wisconsin Rapids Dam, $10,396. Wisconsin River Paper and Pulp Company: lower Stevens Point Dam, $6,964. Whiting Plover Paper Company: Plover Dam, $171.

Nekoosa Edwards Paper Company: Centralia Dam, $4,686; Port Edwards Dam, $4,115; and Nekoosa Dam, $6,924. Wisconsin Power and Light Company: Wisconsin Dells Dam, $7,280, and Prairie du Sac Dam, $12,060.

Figures released at the Improvement company's office at Wausau last week showed a net loss of 935,000,000 cubic feet in water stored in the company's total reservoir system during the previous week. Loss in the upper reservoir system of 639,000,000 cubic feet and that in the Big Eau Pleine reservoir was 296,000,000. The reservoirs were filled only to 67.01 per cent of their total capacity.

Total storage was 11,629,000,000 cubic feet, as compared to 14,317,000,000 feet at the corresponding time in 1943.

Four-Day Strike Ends

A four-day strike which began Monday morning, July 31, at the Fox River Paper Corporation, Appleton, Wis., was ended Friday morning, August 4, by Local 16 of the International Brotherhood of Papermakers.

The strike of the corporation's 435 employes followed a special meeting Sunday, July 30, of Local 16, called to discuss a wage case involving the corporation and its employes which has been before the War Labor Board since last October. The company and the union had agreed to submit a large number of requests for wage adjustments to the WLB for a decision. A number of hearings had been held on these and subsequent requests, but WLB had not announced a decision.

The War Labor Board held a hearing Wednesday in Chicago when the officers of the international and local unions agreed to order a return to work. The agreement was sustained at a local union meeting the following day .

Ernest Lambton, vice-president of the International Brotherhood, said that the "union went on record to comply with the board's direction, to carry out the patriotic 'no-strike' pledge made by the union to the president, and to cooperate in every way with the war effort."

Company spokesmen said that WLB informed union representatives in Chicago that nothing would be done for the union until work was resumed and that the union had no excuse for interrupting vital war production.

At the Chicago hearing, company representatives agreed not to exercise the company's right to rescind the contract with the union, it was stated. The company asserted that the union violated the no-strike clause.

In a telegram to Mr. Lambton, the labor board

(Continued on page 24)

Canada Plans For Larger Post-War Trade

Announcement By Minister of Trade To Set Up Export Credit Corporation Viewed As Possible Extension of Pulp, Paper and Other Products — Plan New Attack On Spruce Budworm — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 7, 1944—Producers of pulp and paper and other forest products who are looking to the possibilities of a large extension of their trade in overseas markets after the war have been considerably encouraged by a plan announced by the Minister of Trade and Commerce to set up an Export Trade Credits Insurance Corporation whereby Canadian exporters will be able to have their exports insured. The bill also would authorize the government to guarantee the purchases in Canada of a foreign government or its agent. The legislation is modelled on that in the United Kingdom, where a similar plan has been in existence for about 15 years, and the Minister explains that the scheme will place Canadian exporters on a fair competitive basis with those in other countries where some kind of public assistance is being given to exporters to push foreign trade.

The first part of the scheme, which is not likely to be made operative until peace comes, is designed to insure exporters against loss in the business they do with buyers in other countries. The second part is to be operative for the next three years, the transition period, and it provides for the Canadian Government setting up credits for foreign governments or their agencies so that those countries whose economies have been dislocated or destroyed by the war will be able to buy Canadian goods. The aggregate maximum of government aid under part 2 at any time is fixed at $300,000,000, of which $200,000,000 is the maximum set for guarantees, and $100,000,000 for securities of foreign governments purchased.

Explaining the bill, government spokesmen said the Canadian corporation would charge insurance premiums low enough to encourage exports, and the premiums would be fixed according to the risk involved. The opinion was expressed that Canada's best markets were in Europe, but it was also explained that tremendous reconstruction work would have to be done in China after the war, and the Chinese government or its agents could have its Canadian purchases guaranteed. Before the goods left Canada, it was added, the Canadian exporter would receive full payment from the Canadian Government.

Plan To Attack Spruce Pest From Air

Plans for elaborate air attacks on insect pests injurious to forests are being studied by federal and provincial government authorities in Canada, to be developed on a wholesale scale after the war if experiments now under way prove successful. Recently a small section of Canadian forest infested with the destructive spruce budworm has been sprayed with new insecticides from the air. The experiment was a co-operative one between the respective Departments of Agriculture of the United States and Canada, the United States supplying the plane, the pilot and the insecticides. The sprays were deposited by a biplane flying at 80 miles an hour from as low as 25 feet above the tops of budworm infested spruce and balsam trees. It will be several weeks before the results of the experiment can be estimated, and the full effect of the experiment will not be clear until the spring of 1945, when the new brood of budworms would normally be expected to attack the foliage. Tens of millions of dollars' damage has been done by the ravages of the spruce budworm in Eastern Canada, extending from New Brunswick to Ontario, and so far no effective control has developed.

The use of the airplane for entomological work is no new idea in Canada. In 1921 an airplane was employed in the survey of mosquito breeding areas in the Fraser Valley, and for several years the Dominion Department of Agriculture has carried out experiments to determine the value of the airplane in the control of spruce budworm and other forest insects. The principal interest in the latest experiment in which the U. S. Department of Agriculture cooperated lies in the effect of new insecticides which have been developed.

Forest Fires in Nova Scotia

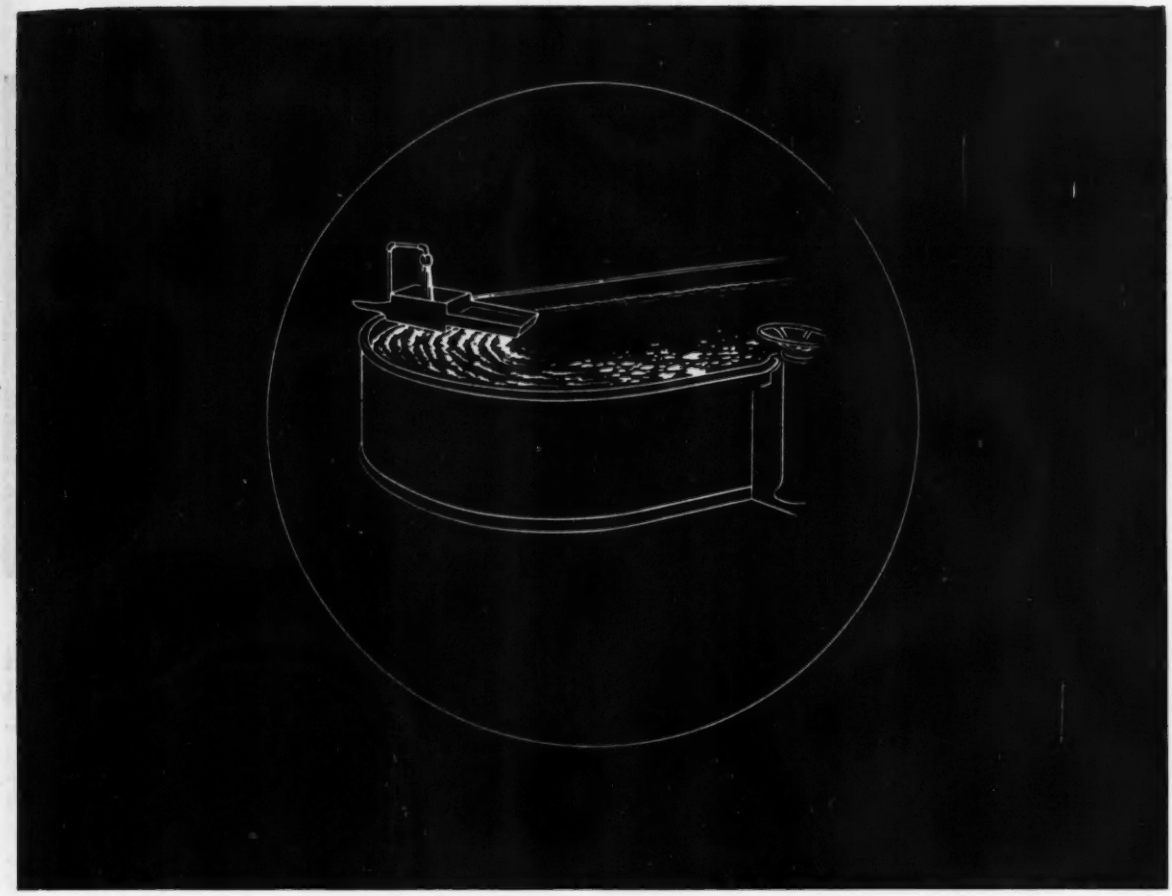
The quarterly report of the provincial Fire Marshal for Nova Scotia tells of extremely heavy forest fire losses in that province in the six months period ending June 30 last. The number of fires totalled 934 and an overall property loss of 41,497,660 was incurred. The report described these losses as appalling and said: "If this heavy rate of burning and loss of life continues, Nova Scotia may have its heaviest fire loss yet recorded." Deaths during the period, as a result of the fires, totalled 16 and 44 were serious injured.

Plan Forest Exhibition at Quebec

As part of an intensive campaign to promote interest in forest conservation, a largely attended forest exhibition has been held at Quebec, at which a wide range of forest products was on display. In inaugurating the exhibition, Avila Bedard, Quebec deputy minister of lands and forests, and president of the Quebec Forestry Association, said that one of the main reasons of the gathering was to help solve one of the most important of post-war problems, the best and most rational use of our natural resources and especially of our rich forest resources. Most of the exhibits were the work of members of "4-H" clubs. Upwards of 200 youngsters belonging to these clubs exhibited some 700 varied articles made at the provincial government's forest rangers' school at Duchesnay.

Union Bag Contract For Rust

Contract for design and construction of a new high pressure steam plant, new power generating station and other auxiliary work in the 1944-45 expansion program of the Union Bag and Paper Corp., at Savannah, Ga., has been awarded to the Rust Engineering Company, of Pittsburgh, Pa., and Birmingham, Ala. The project, valued at approximately $1,500,000, will include alterations and modernizations of the Paper Corporation's existing steam and power generating facilities at Savannah.



Start Slime Control Here!

This is the "spot" to add "Lignasan"—the powerful bactericide and fungicide that controls slime-forming bacteria. Chances are that the pulp and water in your storage chest or connecting pipes will become infected with slime. *Don't risk this costly gamble!* Add "Lignasan!" As little as 3 to 5 ounces of "Lignasan" per ton of fiber, dry basis, bled into the headbox prevents the formation of slime on the paper machine. Puts an end to clogged screens, excessive scrap and wasted labor.

Use "Lignasan," too, as a spot treatment wherever slime persistently forms. As a beater disinfectant, from 3 to 5 ounces per ton of fiber, dry basis, is frequently sufficient to control slime throughout *all* the "wet" papermaking processes.

Get the facts today on how "Lignasan" can help you control slime, preserve pulp, prevent clogging of alum lines and keep your mill operating at *top* efficiency. Write our nearest branch office or E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

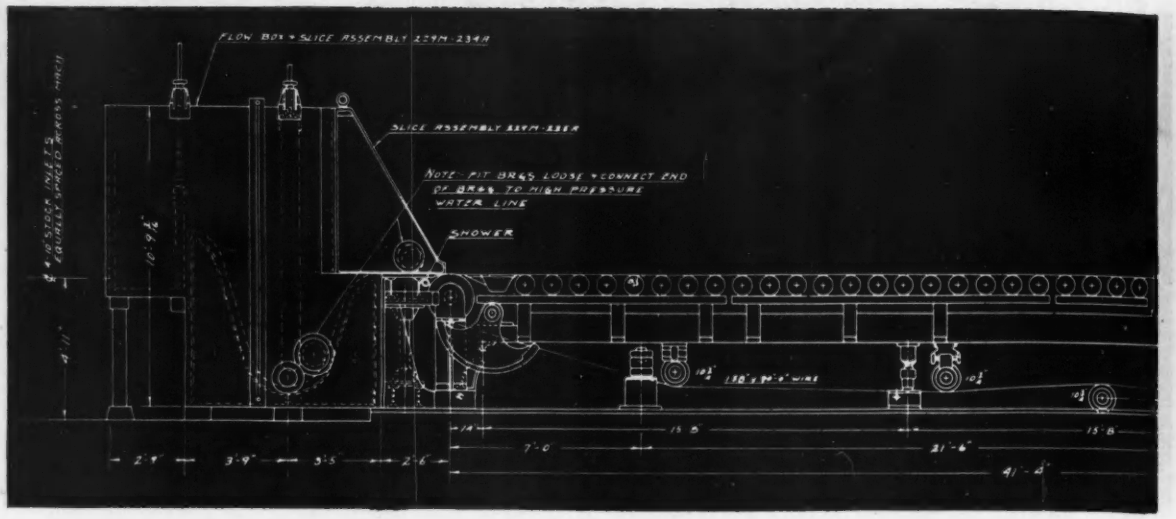
CONTROLS SLIME
PRESERVES PULP

Du Pont Lignasan
REG. U. S. PAT. OFF.

BACTERICIDE AND FUNGICIDE

DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



How to combat Corrosion on Fourdriniers

When planning essential replacements and future fourdriniers, consider these advantages of Monel:

1. Corrosive paper stocks and white waters as usually encountered have little or no effect on this high nickel alloy. There is no pitting...surfaces retain their original smoothness. The results shown in the table at the right are typical of Monel's corrosion resistance.

2. Under exposure to the corrosive conditions generally met, Monel is used safely in combination with bronze and copper fourdrinier parts.

3. Monel is both stronger and tougher than mild steel. Its resistance to sagging is practically twice that of brass.

4. Any of the commonly used methods may be employed for welding, soldering or brazing. In addition, Monel is readily machined, drawn or forged.

Ask our technical staff for assistance with your problems. Among the helpful publications available are *"Selection Guide to 28 Problems on Fourdriniers"* and Bulletin C-3 *"Monel, Nickel and Inconel in Pulp and Paper Mills."* Write for copies.

PRINCIPAL USES OF MONEL ON FOURDRINIER WET ENDS

Flow Boxes—Monel linings from .037" to ⅛" thick are applied to wood or steel boxes. Some are of self supporting Monel sheet construction, or built from nickel-clad steel.

Flow Box Midfeathers—Wood construction lined with .037" to .062" Monel sheet.

Apron Plates—Monel strip from 1/16" to ½" thick, supported by steel frames.

Slice Blades—(flat bar type and flexible slices). These are of ⅛" to ¼" thick, special temper cold rolled Monel strip. Flexible slice lips up to 250" long are supplied.

Breast Rolls—Steel rolls covered with ⅛" to ¼" Monel provide wear and corrosion resistance as well as high stiffness at relatively light weight.

Table Rolls—Monel seamless tubing for diameters up to 5". Monel-covered steel tubes for larger diameters.

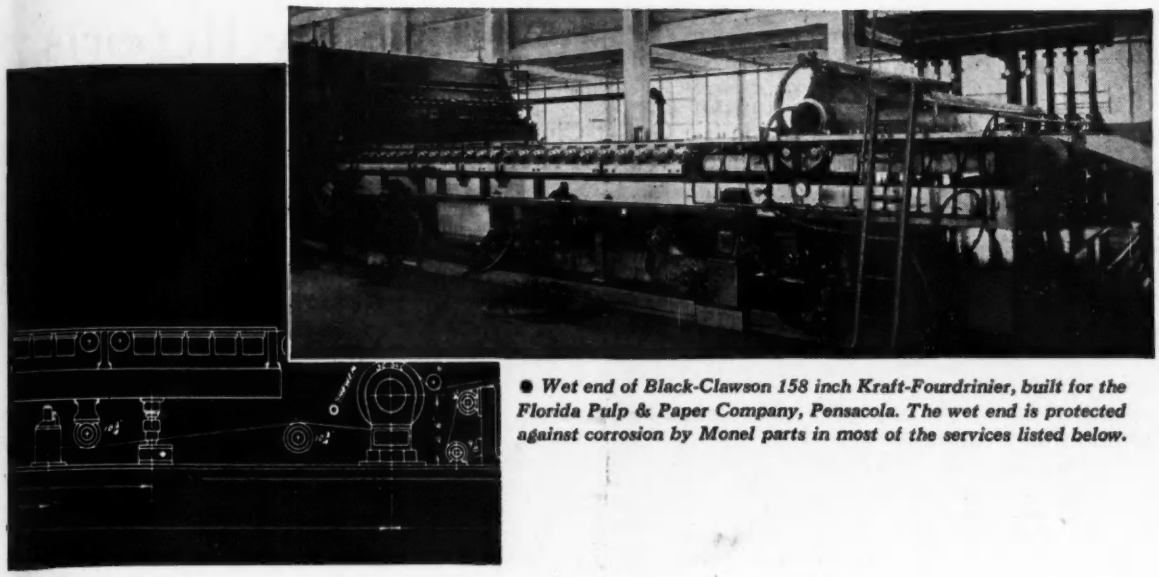
Dandy Rolls—An especially rigid and corrosion resistant roll body is built from Monel strip and wire with Monel wire cloth facing.

Suction Boxes—Boxes welded from ⅛" and ¼" Monel sheet are strong and of light weight.

Suction Box Covers—Monel covers have been used 2 years and more without resurfacing. Covers are made from ¼" thick full hard temper Monel strip.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK 5, N. Y.

Monel



● *Wet end of Black-Clawson 158 inch Kraft-Fourdrinier, built for the Florida Pulp & Paper Company, Pensacola. The wet end is protected against corrosion by Monel parts in most of the services listed below.*

Wire Return Rolls—Monel covers (⅛" thickness) over steel tubes. Roll covers are ground to finished diameter.

Fourdrinier Rails—.037" to .050" Monel sheet lined steel or cast iron rail construction.

Fourdrinier Side Beams—.037" to .050" Monel sheet lining over steel or cast iron rails.

Shaker Springs—"Z" nickel of full hard temper and age hardened is used for flat spring leaves of shakes with high stroke frequencies.

Save-All Trays and Pans—.062" to ⅛" Monel sheet is used generally for strong, durable, welded construction.

Cross Braces—.025" to .037" Monel is used for lining steel pipes.

Fourdrinier Brace Rods—Cold drawn Monel rods.

Remover Cross Drive Shafts—Cold drawn Monel rods.

Remover Beam Tracks—Gall resisting, high hardness cast "S" Monel for rollers or tracks; companion part is bronze.

Fourdrinier Remover Beams—.025" to .037" Monel sheet covered steel construction.

Shower Pipes & Nozzles—Seamless Monel tubing for pipes, and "R" Monel rod (200 BHN) for machined nozzles provide stiff and wear resisting showers.

Doctor Blades & Backs—Full hard Monel blades for bronze rolls. Monel sheet and angles for doctor back construction.

Bolts & Other Fastenings—Monel fastenings are used safely in combination with bronze or copper fourdrinier parts.

CORROSION RESISTANCE OF MONEL TO PAPER STOCKS AND WHITE WATERS OF FOURDRINIERS*

Paper Stock	*Location of Monel Specimen*	*Stock Consistency*	*pH of Stock*	*Temp.*	*Corrosion Rate in Inch Penetration per Year*	*Remarks*
DE-INKED PAPER stock containing small amounts of SO_2, CL_2 and H_2SO_4	Immersed in headbox Middle West Mill.....	.....	4 to 4.5	.....	0.0001	Smooth surface, no pitting
NEWS PRINT 80% groundwood, 15% unbleached sulfite pulp	Immersed in headboxes 3 Northwestern Mills.....	2.8% to 3%	4.7 to 5.1	85° F. Average	0.0003 to 0.0014	Smooth surface, no pitting
KRAFT alum treated	Immersed in headboxes Northern Mill..... Southern Mill.....	....	6.5 to 7 4.5 to 6	95° F. Average	0.0001 0.0005	Smooth surface, no pitting
SULFITE bleached pulp	In save-all trough Middle West Mill.....	0.1%	6.8	140° F. Average	0.0008	Smooth surface, no pitting
BOND AND STATIONERY 100% linen and new cotton, rosin and alum sized	In feed line ahead of machine screen Eastern Mill.....	0.5%	6.5 to 7.3	84 to 130° F.	less than 0.0001	Smooth surface, no pitting
● **CIGARETTE PAPER**	In white water box connected with suction boxes Southeastern Mill.....	.....	9.0 to 10.0	66 to 75° F.	less than 0.0001	Smooth surface, no pitting

**Tests conducted by paper mills in collaboration with Inco Development & Research Division.*
Test method in accordance with ASTM specification A 224-39T.

Midwest Concerned Over Priority Reports

Heavy and Increasing Government Requirements For Paper and More Rigid Allocation To Get It Clouds Fourth Quarter Civilian Prospects — Waste Dealers Wait OPA Ruling — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., August 7, 1944—There is little or no comment in the Chicago market as far as the immediate outlook is concerned. Everyone is "set" for the next two months but the fourth quarter pulp allocations, now shrouded in mystery, are really the only subject of comment. Jobbers and mill representatives long ago stopped worrying about how to handle civilian business except to exhibit courtesy, cooperation and the hope that accounts would thoroughly appreciate what the industry is up against.

Locally, certain grades of paper have reported allocations to the government increasing from as much as 20% to 35% with 30% of that 35% earmarked for the six most important top claiming agencies. Leaving other governmental agencies with only 5% of that amount may increase the clamor for placing priorities on paper—and such a priority threat is another cause for concern in these quarters.

There is no particular point, say local commentators, in singling out any line such as sulphites, books, covers, krafts or groundwoods for emphasis. All are deeply involved in wonderment and concern as to just how far government must go to get paper to fill both military and government agency requirements.

Meanwhile, the waste paper market, blessed with excellent pick-up weather and an outstandingly purposeful publicity program behind it, is doing "as well as could be expected" with plans for the next big salvage drive getting a lot of newspaper lineage.

Waste Dealers Want OPA Ruling

It seems obvious, from reports, that Chicago's waste paper dealers have by no means made up their minds as to the beneficiality—or lack of it—of OPA orders to increase waste paper prices. Some dealers believe that improved collections of the past week are due directly to the "stimulating quality of the order." Others feel just as strongly that waste paper drives and the approaching "big drive" on August 12 are the reasons for the improvement. At any rate, OPA is making a survey of conditions and no changes, in answer to some complaints on that part of the regulation pertaining to baling, have come through as yet. It may be, say local OPA offices, from ten days to two weeks before OPA clarifies those particular notations which divided the waste paper into that packed in bales of 500 pounds or more and that not baled or packed in bales weighing less than 500 pounds. The only thing definitely known is the fact that OPA has received a generous amount of complaints from this area particularly in an effort to get a more adequate explanation of the baling ruling described above.

Salesmen Discuss Trade Matters

The western division of the Salesmen's Association of the Paper Industry held its regular noon luncheon meeting on July 31 at the Hotel Sherman. Division Vice President "Pat" Patterson of Flambeau presided at the round table discussion. The final golf outing at Knollwood was announced. It will be held August 18. The association will hold only informal round table discussions in August but are expected to resume the system of selective speaking programs after Labor Day.

Metropolitan Area Plans Waste Drive

Chicago's suburbs have been given a goal of 5000 tons of waste paper for the Saturday, August 12 pickup drive in this area. Quotas have been set for each town within a fifty mile radius of Chicago and these outlying towns will try to get half of the entire areas' 10,000 ton quota. If the quota is reached it will be the largest single collection to date in any like area in America, according to W. L. McFetridge, salvage director. Each suburb will direct its own pickup. Village trucks will be manned by Boy Scouts, OCD workers and other volunteers—many of them business men home on a "half holiday." Working with the salvage chiefs is the Chicago Newspaper Publishers Association and the Periodical Publishers National Committee which has 125 men working in the midwest on paper salvage.

In Chicago those wards which lagged in pickups in January and June are being given special attention and OCD block captains and officials are doing a lot of concentration here to insure success of the program. Oak Park, Chicago suburb, will have the highest quota of the surrounding towns—469,000 pounds. Next highest will be Aurora with 336,000 pounds.

Association Plans September Outing

The Chicago Paper Association, one of the most active groups of its kind in this area, is holding its annual golf outing on September 12 at the Elmhurst Country Club. Joseph Druth is chairman of the outing committee which has been busy for some weeks to assure members and guests of an unusually interesting event. Other members of the committee are William Shapland, Fred Rudolphy, William Chukerman, Lou Brown, George Ickes and William Knox.

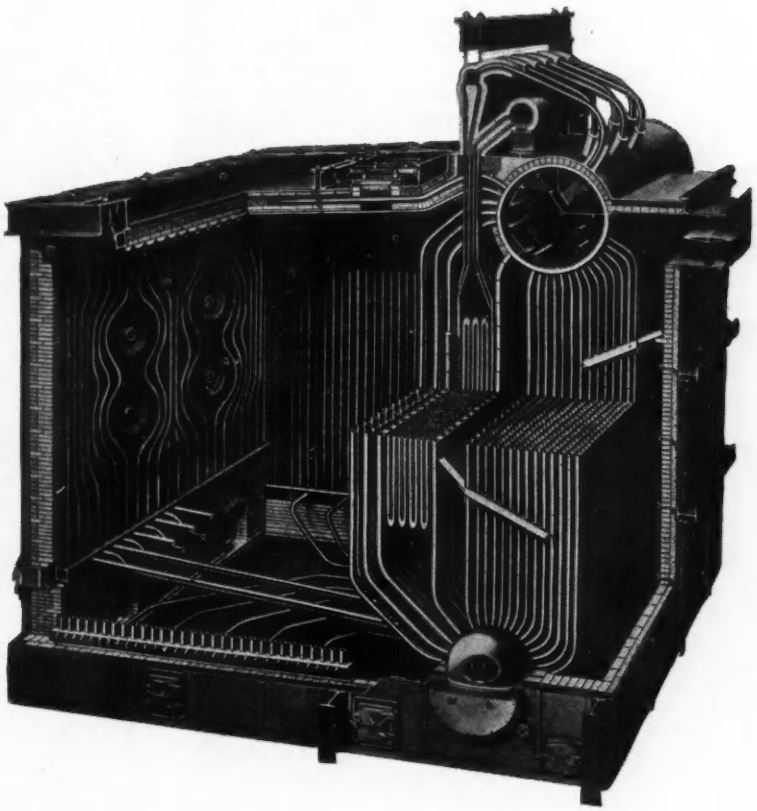
The annual golf outing with the informal dinner in the evening has become the largest of its kind in the paper trade, according to members of the Association—and on its record as well. It is attended by merchants and mill executives from all parts of the country and reservations for the current event are already in from points as far East as New York and West, as California.

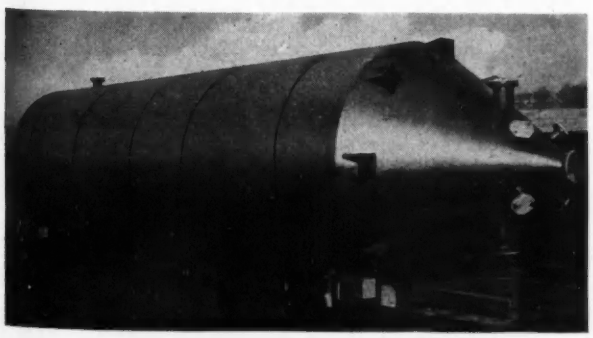
The outing has another and far better cause than just the promotion of a day of good fellowship. The entire proceeds of the CPA tournament are to be contributed to the Chicago Servicemen's Centers which have become nationally known for their contribution to the entertainment and welfare of members of the Armed forces. Paper trade executives expecting to be in or near Chicago on September 12 are urged to contact William S. Knox of Knox & Schneider or any member of the above committee for full details.

TO THE PAPER INDUSTRY

STEAM GENERATING UNITS

For all paper mill steam requirements from the smallest to the largest, the VU Unit has proved its suitability. A thoroughly standardized and time-tested design, it has achieved a reputation for dependable and economical service. VU Units are burning pulverized coal, oil, gas and combinations of these fuels; they have also been equipped with bark-burning furnaces. The VU-Z Unit, an adaptation of the VU design, is especially suited to stoker firing. Present installations in paper mills range in capacity from 20,000 lb of steam per hr, through relatively small increments, up to 225,000 lb. A unit of the latter capacity has been in service in the West Point, Virginia, Plant of the Chesapeake Corporation for more than a year. The aggregate capacity of VU Units in paper plants is 2,500,000 lb of steam per hr, a striking indication of the extent to which the paper industry has decided that this unit is the best answer to its steam generation problem.





DIGESTERS and PRESSURE VESSELS

Many C-E built cylindrical digesters of the type illustrated here, as well as others of the spherical type, are in service in the paper mills of North America. The extensive facilities of C-E Shops are available for the fabrication of many other types of pressure vessels employed in the manufacture of pulp and paper. These are built to your specifications by highly skilled personnel with extensive and diversified experience in this type of work. Consult C-E now on your post-war pressure vessel requirements.

A-807

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Alaska Seen as Possible Rival of Canada

Current Survey of U. S. Forest Service In Tongass Region In Alaska May Create New Competition With Canada For Pulp and Paper — Interest Shown In Forest Conservation — Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 7, 1944—A possible post-war competitive threat to Canadian pulp and paper interests is seen in the announcement that the United States Forest Service this summer is carrying out a survey of the possibilities for establishment, after the war, of a permanent pulp and paper industry in the Tongass National Forest in southeastern Alaska. The forest supports hemlock and spruce timber said to be sufficient to produce annually around 800,000 tons of sulphate or sulphite pulp.

That this development is not something for the far distant future is evident from the intimation that sealed bids may be asked after December 1, this year, if the survey results in the findings anticipated. A nine-months cutting season and plenty of hydro-electric power are favorable conditions for the enterprise. Presumably the timber would be sold to United States pulp and paper makers with a condition of sale requiring buyers to set up mills in Alaska.

It is pointed out that this development could mean a serious impediment to the expansion of Canadian pulp and paper interests for some years to come.

Interest Shown in Forest Conservation

Considerable discussion is taking place concerning the suggestion that Canada should have a Federal Ministry of Forests or some central administrative body to control the development and provide protection for the industry. Two typical opinions are given as follows:

Hon. W. Earl Rowe, M. P., President, Great Lakes Paper Company, Ltd.: "Forest industries have grown rapidly to a place of great importance in our national economy. I believe a Dominion Department of Forestry or a new branch of the Department of Mines and Resources, should be established. The operations of this department should not be allowed to conflict with Provincial rights, but this function should be in co-operation and co-ordination with the services of forestry, entomology and pathology to preserve our forests against insects and disease that are reported from our Dominion departments as already doing more damage than fire. Research and international trade relations can also be promoted by such a Dominion department without any conflict with, but as a constitutionally sound supplement to our several provincial departments of lands and forests."

Mr. Elmore Philpott, well known in newspaper and political circles in Vancouver, B. C.: "We do not need a national ministry of forestry. The move would be backward and rightly resisted by provinces. Experience with the national fisheries department should constitute a warning. Problems are greatly different for the East and the West and a single control therefore is bad. We do need a law for every Province putting its annual cut on a crop basis as in Sweden, with compulsory replacement equal to total wastage due to cut, fire and disease. National authority could regulate exports on the above basis and also greatly extend research into wood products. The greatest national help would be a mixed system of public and private enterprise which would provide a stable total domestic market in building trades."

Drought Causes Apprehension

Although there have been some light rains in the northern watersheds of Central Canada recently, the precipitation has been much too light to raise river levels to a point where they can carry down wood, piled on the river banks, to pulp and paper mills. Canadian pulp and paper officials state that it will be another month yet before it will be known whether the Canadian newsprint mills can continue to deliver 200,000 tons monthly to U. S. consumers during the fourth quarter. To date they have succeeded in fulfilling their obligations for that amount each quarter in spite of difficulties.

Michigan Div. Plays Golf

KALAMAZOO, Mich., August 5, 1944—The annual Golf Tournament and dinner, one of the traditional activities of the Michigan Division of the American Pulp and Paper Mill Superintendents Association was held at the Kalamazoo Country Club on Friday, August 4 with ninety attending. The tournament started at 2 P.M. with a big field of starters and gracious hospitality provided at the 19th hole ably presided over by Chairman Glen Sutton with Norman Scott and Don Monteville assisting.

Dinner was served at 7 o'clock in the main dining room of the Club House. At its conclusion the Golf Committee consisting of Al Sherwood, Paul Bartholonew, and C. "Baldy" Smith, took over and proceeded with the announcing and awarding of the prizes.

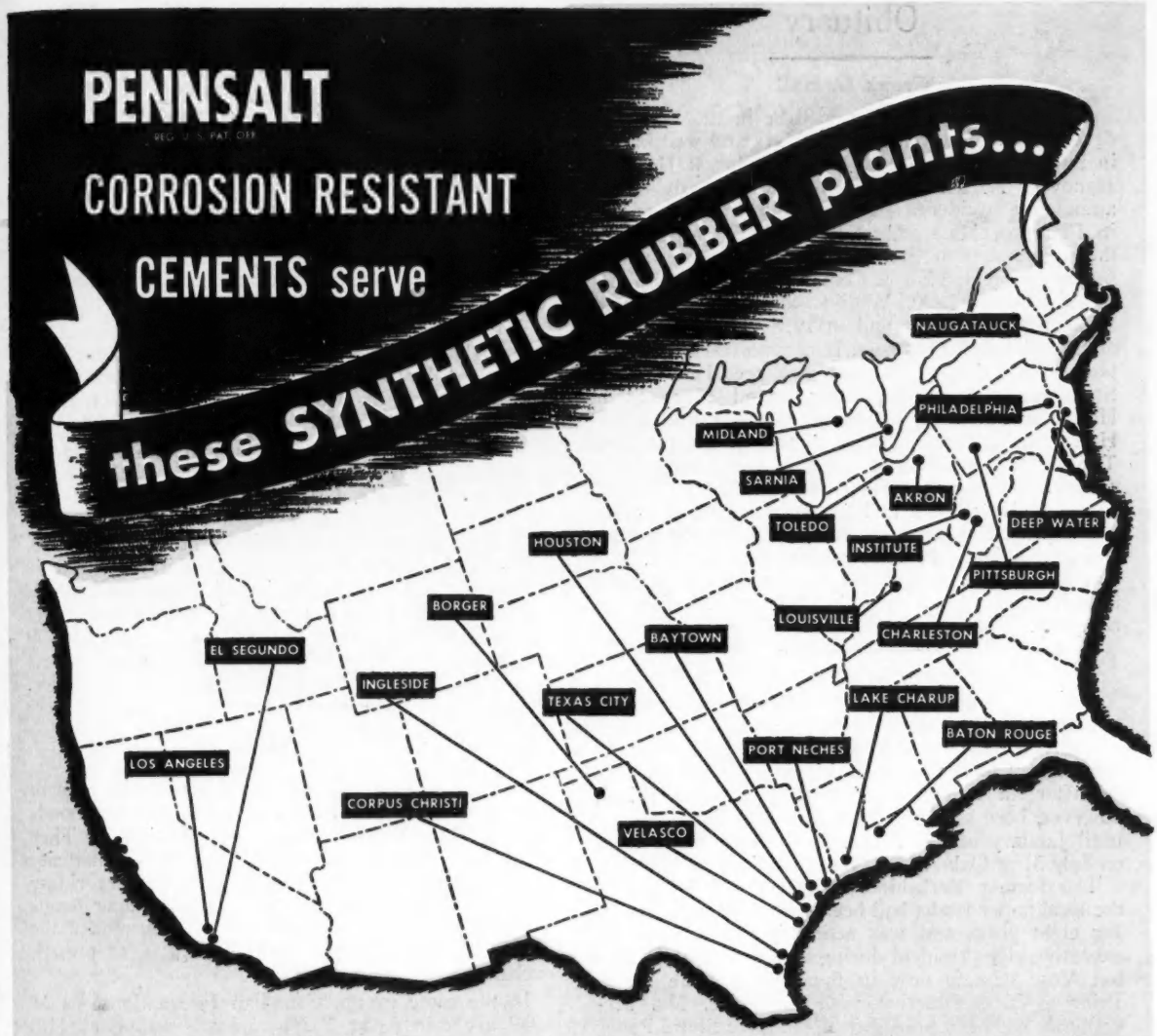
Door prizes for those who did not play were won by James Foxgrover, W. H. Astle, Arnold Weller and Jake Parent. Golf prizes as follows were awarded: Low Gross, Larry Allen; High Gross, Dave Snedeker; Blind Bogey, Bill Kirkpatrick, Fred Chappel and Harold Sinclair tied. Kirkpatrick won. Best First Nine, Bob Van Kirk, Bill MacArthur and Leo Willoughby tied. MacArthur won. Best Second Nine, Art Woollam. Most Fours, Richard Lane. Most Fives, Clint Wainwright. Most Sixes, Ralph Atkins. Most Sevens, Art Cole and Walter Shaw tied. Shaw won. High Score on Any One Hole, Jack Dickson. High Score on Nine Holes and being unable to finish the 18, Joe Longhead. He received a cane. For Efficiency at 19th Hole, Glen Sutton. For Courtesies Extended, Bill Sanders. For Easier Teeing, Fred Chappel, a mammoth tee, he being the Division's tallest member.

To Frank Kennett, club pro, was presented a large picture of the pond and Club House. Chairman Glen Sutton, in a brief address, paid tribute to the mill managements for their co-operation during his administration and also called on various members and associates, thanking them for the assistance tendered him in carrying on the season's activities. An announcement that the fall meeting of the Northwest Division would be held September 8 and 9 at the Duluth Hotel, Duluth, Minnesota, was made.

PENNSALT

REG. U. S. PAT. OFF.

CORROSION RESISTANT CEMENTS serve these SYNTHETIC RUBBER plants...



Virtually overnight, America was faced with a grave need for rubber . . . and the sources of supply were shut off! Remember? Well, out of that crisis came the urgent call for synthetic rubber.

Industry's response has been one of the truly amazing stories of service. A few short years ago there were no Synthetic Rubber plants in America. Today there are 24. And Pennsylvania Salt is profoundly proud of the fact that Pennsalt Corrosion-Resistant cements have had a place in the building and maintenance of 22 of these all-important plants. *Penchlor, *Asplit**, and *Causplit** are contributing to the success of synthetic rubber production.**

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Consult Penn Salt technicians concerning your acid or alkali handling problems. Their wealth of experience is at your service without obligation on your part. Write fully or mail the attached coupon.

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Obituary

Frank G. Hall

Frank Griswold Hall, a pioneer in the industrial development of starch and adhesives and well known in import circles, died at Mary Hitchcock Hospital, Hanover, N. H. on July 30 as a result of an automobile accident. Born seventy-three years ago in Florence, Mass., Mr. Hall took a position with the partnership of Stein, Hirsh & Company, predecessor of Stein, Hall & Company, Inc., New York, as office boy in 1890. Within a decade he was made a partner in the firm and in 1918 became president of Stein, Hall & Company, Inc., a post held until the time of his death. He was also president of The Stein-Davies Company, Long Island City; Stein, Hall Manufacturing Company, Chicago, and Stein-Hall Ltd., Toronto, and in 1920 founded the Hall Trading Corporation, Rotterdam, a foreign subsidiary. He was a member of the Union League Clubs of New York and Chicago and president of the Tapioca Products Association. Surviving are his widow and four daughters. Four years ago Mr. Hall was honored by a banquet on the occasion of the fiftieth anniversary of his connection with the company.

Perry McGillivray

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., August 7, 1944—Perry McGillivray, executive vice-president of the Berkshire Paper Company, Chicago paper distributors, died on July 27 after an illness of over two years. He had, however, been active in his duties with Berkshire up until January of 1944. Mr. McGillivray was buried on July 31 at Oak Abbey. He is survived by his wife.

The former Berkshire executive, well known in the local paper trade, had been with that organization for eight years and was acting in the capacity of executive vice-president during the absence of Hamilton Vose who is now in the United State Navy. Prior to his connection with Berkshire, Mr. McGillivray had been president of the Lake Shore Paper and Twine Company for many years and was widely known in trade circles.

No announcement has been made concerning personnel changes resulting from Mr. McGillivray's death. It is expected, however, that much of the detail work on accounts will be carried on by Miss Rose Peskind who has been Mr. McGillivray's private secretary and assistant for many years.

Joseph E. Dow

Joseph E. Dow, 57, widely known in the paper and pulp industry died as the result of a stroke suffered in Mexico City, Mexico, last week. Mr. Dow was recovering and his wife had expected he would be able to return home shortly, when he died suddenly last Sunday.

Mr. Dow was born in Chile, was sent to Scotland for his education and came to the United States when a boy. He was associated with the Eastwood-Nealley Corporation, Belleville, N. J. as sales manager. On January 1, 1931, Mr. Dow began his connection with Castle & Overton, Inc., New York, and was manager of the concern's machine and equipment division for thirteen years.

Surviving are his widow Alice, a daughter Alice Dow Holland and a brother Andrew.

Urge Early Filing of WPB Reports

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 2, 1944 — David Graham, Chief of the Pulp Allocation Office of the War Production Board, today urged every company in the pulp and paper industry to file promptly its fourth quarter report on the new form WPB-2973.

Since the new forms are almost identical with those used in the third quarter, mills should have no difficulty in getting their reports into the hands of the Pulp Allocation Office by August 5, making it possible for the WPB to complete fourth quarter pulp allocations on schedule, he said.

Mr. Graham warned the industry that mills filing reports late would run the risk of not being included in the regular allocation, and that their applications for pulp might be treated as appeals and handled separately after the other allocations were made.

The industry responded most satisfactorily to the appeal of WPB for the prompt filing of their third quarter forms, Mr. Graham said, pointing out that their cooperation made it possible for his office to mail the complete pulp allocations to mills by June 20, giving users of wood pulp an opportunity to plan their operations before the beginning of the quarter, July 1.

Pulp producers were reminded that the new filing date for their quarterly reports on form WPB-699 is August 8, at which time fourth quarter reports should be in the hands of the Pulp Allocation Office.

Paper Stocks As Investments

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 7, 1944—As an investment offering both good income and capital security, bonds of Consolidated Paper are being recommended. They provide a fairly generous yield (over 5% to maturity at present price of 102 to 103) and yet are riding free of redemption price. Consolidated Paper bonds are payable in U. S. funds so that in reality the callable price of 100% is 110 Canadian, at present exchange rate.

In the same group, Canadian International 6s of 1949 are callable at 102% and are selling at 112. Canadian, and Fraser Co's 6s of 1950 are callable at 103% and are selling at 110. Both of these issues also are payable in U. S. funds, and are in some respects stronger in position than Consolidated's, but present earning power of Consolidated, and the remarkable record of improvement in general financial position of the company during the last ten years, has added new investment merit to these bonds, since two years ago, when they were selling in the sixties.

Boston Trade Notes

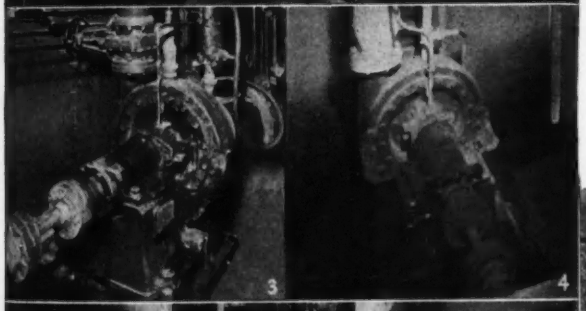
[FROM OUR REGULAR CORRESPONDENT]

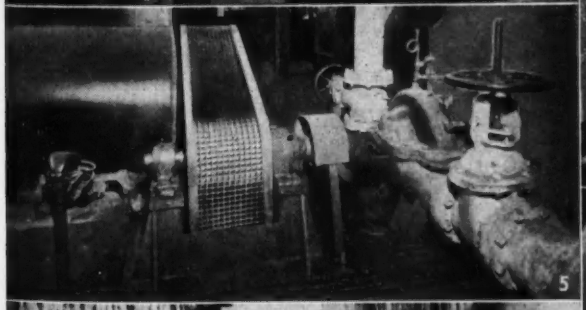
BOSTON, Mass., August 7, 1944—The paper stock market is slow. In some cases, this condition is due to lack of material. Waste paper is used up very quickly, without enough to meet the demand, but bagging moves more slowly.

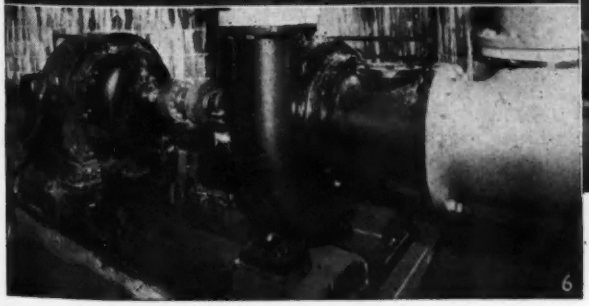
Arthur Schroeder, president and manager of sales, Pejepscot Paper Company, of New York, was in Boston for a day recently, visiting the branch office here and making a few calls on the trade, leaving for two days at the mill in Brunswick, Me.

Arthur J. Howland, vice-president and assistant treasurer of Tileston & Hollingsworth, manufacturers of "Old Fashioned Papers," has returned from a month's pleasure trip to Montana.

These PUMPS help make 590 TONS of Paper and Paperboard a day





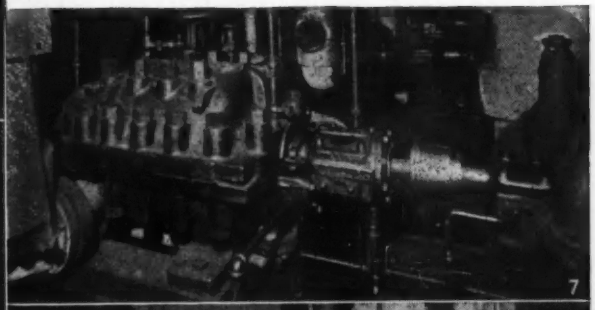


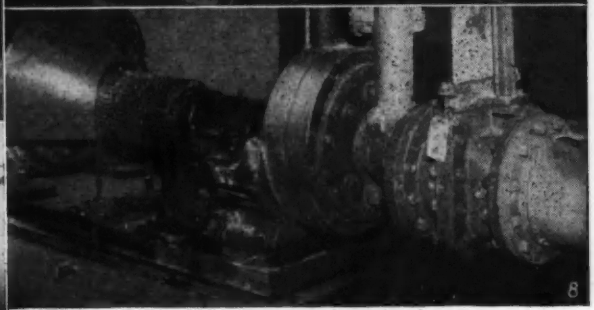
These pumps were installed by one of the many mills that use Ingersoll-Rand pumps because they *stay-on-the-job.*

A dependable I-R pump is available for practically every pulp and paper mill application. There are pulp mill, paper mill, power plant, water supply pumps and many others.

Our engineers will be glad to work with you on your pumping problems. Ingersoll-Rand Company, Cameron Pump Division, 11 Broadway, New York 4, N. Y.

1. *Stock transfer pump.*
2. *Condensate pump.*
3. *Stock from pulp to paper mill.*
4. *Stock to board machine.*
5. *Washdown pump.*
6. *Circulator on pulp washer.*
7. *Boiler-feed pump.*
8. *Stock to machine chest.*





Ingersoll-Rand

10-404

H. L. Horn Writes Donald Nelson

H. L. Horn, sugar broker, 100 Wall street, New York, under date of July 24, sent Donald Nelson, chief of the War Production Board, Washington, D. C., the following letter in part:—"Under date of July 10, 1944, I sent you the following telegram:—'Increasing paper pulp shortage not necessary. I am informed today Mrs. Roosevelt referred my proposal to you for attention under project WPB 134 Forest Products Development a complete report by Vanderbilt University evaluated costs conversion of sugarcane bagasse into paper pulp for kraft pulp within one year with available raw materials on hand also paper pulp equipment from mills now closed not one tree need be cut down. Your personal investigation and attention are urgently required to prevent sabotage in paper distribution division for personal benefits. I will appear before you with proof and complete engineers reports and pilot plant results establishing low costs evidence and quantity pulp can be delivered from waste bagasse awaiting your cooperation.' That telegram has not been answered by you nor have the many requests to the paper division for investigation into the enormous supply of a good paper pulp material being available to produce 200,000 tons of kraft pulp starting at once from raw materials on hand.

"A good paper pulp can be produced from sugarcane bagasse at once, in our land, from a waste material, of no use, with ample available oil for fuel, surplus natural gas for fuel, ample water for a paper pulp mill operation with less labor than is required from wood pulp. I can furnish your War Production Board with all the paper pulp tonnage you claim is short from 400,000 tons now up to 4 million tons annually of this paper pulping material without cutting down one tree for this entire tonnage.

"I have been in Washington on many visits requesting that I be heard and now request that you permit me to produce expert engineer's evaluation reports and proofs of the facts that good paper pulp can be made from waste bagasse and let us, for once and for all, expose the 'sabotage' of paper pulp and lumber subsidized employees in your own War Production Department."

Stewart E. Seaman Opens N. Y. Office

Stewart E. Seaman, who recently opened an office at 122 East 42nd street, New York, was connected from 1929 to March 10 of this year with Rayonier, Inc. He was first employed as their technical director. After setting up their technical department and hiring expert chemists to carry on, he became director of sales and devoted all of his efforts to establishing world markets for the dissolving pulp that had been developed by the company with the assistance of Mr. Seaman. Because of the war his future plans will develop slowly, but it is his intention to act as sales agent and develop new sources of dissolving pulp supply for the rayon and allied industries. There will be a severe shortage of rayon grade wood pulp after the war, and as there are relatively few companies in North America who are in a position to supply the highly purified chemical wood pulp that will be needed by rayon producers in this country, Europe, South America and Japan, Mr. Seaman expects to make available additional supply. The details of his plans must, at the moment, naturally remain confidential.

Heads J. O. Ross Engr. Corp.

S. W. Fletcher, for many years executive vice-president of the J. O. Ross Engineering Corporation, has been elected president of that company and will continue to make his headquarters in New York.

S. W. Fletcher

A. E. Montgomery will continue as vice president of the company with his headquarters in Chicago.

Announcement has also been made of the following other officers: Vice-presidents—H. G. Rappolt and F. W. Partsch; treasurer—J. A. Ronder; secretary—R. W. Grott.

To Hold Power Show December 2

Announcement has been made that the 16th National Exposition of Power and Mechanical Engineering will be held in Madison Square Garden, New York, November 27 to December 2, next. This year's event will be keyed to the effective solution of continuing war production problems, particularly those caused by sudden shifts in military needs, demanded by the ever changing scenes in Europe and Western Oceania. It will also provide informational sources for the advancement of post-war planning.

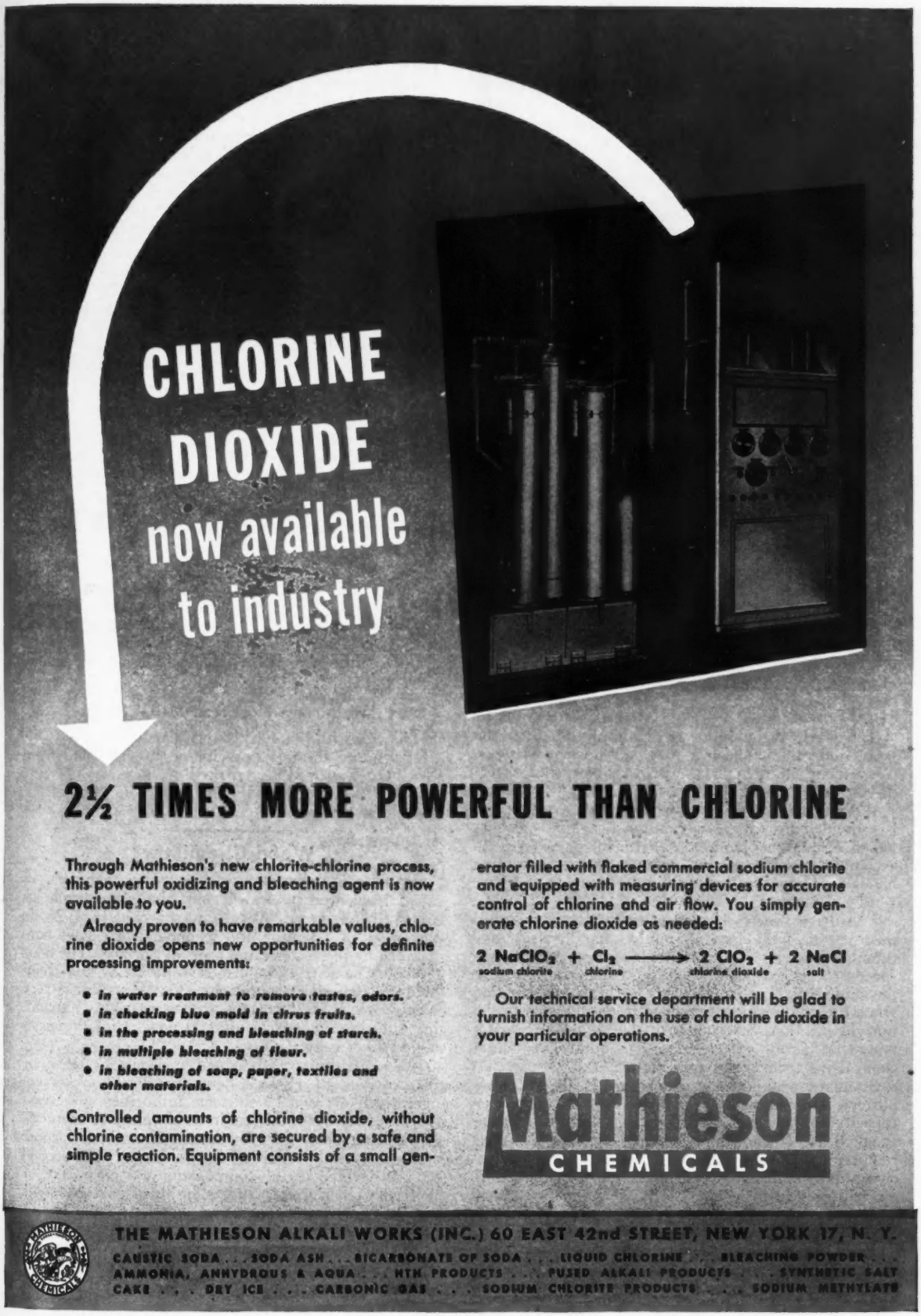
Held biennially, the National Power Show, as it is commonly known, is widely recognized as an effective institution for the development of more effective utilization of the Nation's power resources. The last exposition, held in 1942 in the midst of war work, proved exceedingly helpful to a wide range of new visitors, greatly expanding the service to industries in all fields. It is anticipated that this year's Exposition will attract an even larger number of engineers, executives and operating personnel concerned with current production problems as well as preparations for civilian pursuits.

More space has been provided than at the last exposition, the number of booths has been increased and advance bookings up to the middle of July ensure a greater number of individual displays than in 1942 with a probable waiting list before Fall.

The National Power Show is under the sponsorship of an advisory committee, of which I. E. Moultrop, consulting engineer, continues as chairman. John H. Lawrence is vice chairman.

Charles F. Roth, president, International Exposition Company, is manager and E. K. Stevens, associate manager of the exposition.

As heretofore, the Exposition will be open by invitation and registration to visitors directly associated with power and production operations, but closed to the general public. No admission fee will be charged.



2½ TIMES MORE POWERFUL THAN CHLORINE

Through Mathieson's new chlorite-chlorine process, this powerful oxidizing and bleaching agent is now available to you.

Already proven to have remarkable values, chlorine dioxide opens new opportunities for definite processing improvements:

- *in water treatment to remove tastes, odors.*
- *in checking blue mold in citrus fruits.*
- *in the processing and bleaching of starch.*
- *in multiple bleaching of flour.*
- *in bleaching of soap, paper, textiles and other materials.*

Controlled amounts of chlorine dioxide, without chlorine contamination, are secured by a safe and simple reaction. Equipment consists of a small generator filled with flaked commercial sodium chlorite and equipped with measuring devices for accurate control of chlorine and air flow. You simply generate chlorine dioxide as needed:

$$\underset{\text{sodium chlorite}}{2\ NaClO_2} + \underset{\text{chlorine}}{Cl_2} \longrightarrow \underset{\text{chlorine dioxide}}{2\ ClO_2} + \underset{\text{salt}}{2\ NaCl}$$

Our technical service department will be glad to furnish information on the use of chlorine dioxide in your particular operations.

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CAUSTIC SODA . . . SODA ASH . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . AMMONIA, ANHYDROUS & AQUA . . . HTH PRODUCTS . . . PUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS . . . SODIUM CHLORITE PRODUCTS . . . SODIUM METHYLATE

The Transporter

The "Transporter" is a combination of a foot operated hydraulic lift truck with electric power front wheel drive. This equipment is designed for economical and safe lifting and short hauling of loads at safe working speeds, either on skid platforms up to 6000 lbs. by means of the platform type "Transporter" or pallet unit loads up to 4000 lbs. by means of the fork type pallet "Transporter."

Standard established platform lengths for the 4000 lb. and 6000 lb. capacity platform "Transporter" are 36 to 72 inches. Standard widths are 20 and 26½ inches, with heights 6, 7, 9 and 11 inches. Lift from low to high position is 3½ inches.

Standard established pallet fork lengths for pallet "Transporter" are 30 inches minimum to 60 inches maximum in 2 inch steps. Standard width is 27 inches and fork height in low position is 3⅜ inches with 3¾ inches lift, elevated height is 7⅛ inches.

THE TRANSPORTER IN OPERATION

The platform or forks are hydraulically lifted by pump and ram action with easy foot lever operations. Conveniently located pedal provides shockproof lowering of loads.

With the front wheel drive constant drive power is provided for manueverability in close quarters which enable an operator, either man or woman, to accomplish many times the amount of work than three handlers doing the hauling and spotting in the conventional manner.

The drive control has forward and reverse speed push-button built into the guide handle for easy thumb-tip control. Two speeds forward and two speeds reverse are controlled by raising and lowering the guide handle as required. Drive brakes are applied when the guide handle is moved to or returned to the upright position. Steering turntable is a ball bearing mounted. Front wheel drive has double reduction chain drive from series type motor.

Standard equipment included with the "Transporter" is a nationally recognized battery of proper capacity for adequate daily power supply to operate from 8 to 10 hours depending on the handling requirements also; a portable cabinet plug-in-type charging equipment is available for recharging standard batteries furnished.

The "Transporter" which is made by the Automatic Transportation Company, 101 West 87th Street, Chicago, has proven its ability before and during the war throughout industry and for the Armed Services, to reduce handling operations and simplify materials handling systems.

Mill Men Hold Round Table

(Continued from page 9)

termed the strike a "flagrant violation of the War Labor Disputes Act and the no-strike pledge." The telegram, signed by Leo Kotkin, assistant director of disputes of the Sixth Regional War Labor Board, stated that the "board has acted in this case but there will be no release of the board's directive order until full uninterrupted production is resumed."

Mr. Lambton said that the union members now are awaiting the directive of WLB.

Fox River has been operating at capacity and the production lost because of the strike cannot be made up.

Thilmany Club Grows

The Quarter Century Club of Thilmany Pulp and Paper Company, Kaukauna, Wis., now has 103 members. It was organized February 5, 1941, with a charter membership of 83. New officers will be elected in November. A. M. Schmalz is the current president.

Plan Kimberly-Clark Golf Outing

Committees have been named for the golf jamboree for male employes of Kimberly-Clark Corporation, Neenah, Wis. The event will be held August 12 at Ridgeway Golf Club. Elmer De Prez is general chairman. The jamboree is being held this year instead of the annual golf tournament.

Central Paper Co. Holds Picnic

About 195 persons attended the annual family picnic of the Central Paper Company, Menasha, Wis., on July 30, at Stroebe's Island. A baseball game was one of the features. Dinner was served at noon and a lunch in the evening. Norman Buksyk was general chairman.

Withdraws Northern Mills' Stock

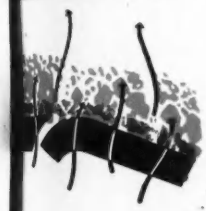
The Securities and Exchange Commission on July 31 permitted the no par value common stock of the Northern Paper Mills, Green Bay, Wis., to be withdrawn from listing and registration on the Chicago Stock Exchange, effective August 7.

Wood Chemistry

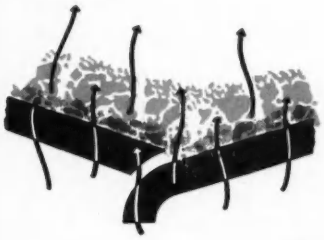
Many comprehensive texts on the chemistry of wood have been published since the Monograph 28, "The Chemistry of Wood," was issued in 1926, in the series of scientific and technologic treatises contributed by the American Chemical Society. The book "Wood Chemistry," published June 19 by the Reinhold Publishing Corporation, 330 West 42nd street, New York, is an important text on a steadily expanding subject. It consists of 900 pages and the price is $11.50 a copy.

"Wood Chemistry" is edited by Louis E. Wise, of the Institute of Paper Chemistry. The book is cooperatively written by thirteen authorities. The text discusses the whole subject in its six parts or chapters. In the first part, the growth and anatomy of wood, and its physical properties, are discussed. The second part is devoted to the components and chemistry of the cell wall in great detail. The third part treats of the extraneous components of wood, and the fourth part discusses the surface properties of cellulose materials. Part five is devoted to the chemical analysis of wood. In the sixth and final part of the book, the several aspects of wood as an industrial raw material are ably presented.

OR MORE STEAM PER POUND OF COAL

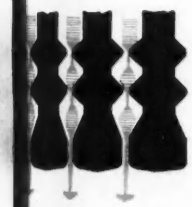


Fuel Bed Processed Continuously



Grates Up—This is the first basic movement of the Link-Grate. It breaks open the fuel bed and thoroughly permeates it with low-pressure air flowing up through the grates. The fused ash in the fuel bed is oxidized and broken into friable pieces.

Grates Down—The second basic movement of the Link-Grate—crumbles and conveys the burning fuel. The fuel bed is kept porous continuously, permitting a uniform flow of gases through the combustion zone. Only low-pressure air is required. This eliminates the need for high-pressure air under the fuel bed and its tendency to blow through the burning coal at thinner spots.



low of Air Controlled

Air is controlled in the Link-Grate and tuyerès by projections in each air passage which give the effect of a series of orifices with chambers between. Air passes through the orifices at high velocities, but this velocity energy is largely transformed into static pressure in the chambers. This arrangement provides excellent cooling by air diffusion. It also causes air flow to increase at a lesser rate when fuel bed resistance decreases, protecting grates from the effects of "blowing through".

Link-Grate motion reduces resistance to air flow by keeping the fuel bed porous. Air flowing through the grates is not smothered, but is allowed to support combustion by thoroughly permeating all parts of the fuel bed. J-50450

For more information about Westinghouse Link-Grate Stokers . . . ask your Westinghouse application engineer for Bulletin 3039. Westinghouse Electric & Manufacturing Co., E. Pittsburgh, Pa., Dept. 7-N.

Westinghouse STOKERS

PLANTS IN 25 CITIES ... OFFICES EVERYWHERE

WESTINGHOUSE

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending August 5, 1944

STOCKS

	High	Low	Last
A. P. W.	4	3⅜	4
Armstrong Cork Co.	43	42¼	43
Celotex Corp.	14⅜	13⅞	13⅞
Celotex Corp., pf.	18¾	18	18
Certain-Teed Products Corp.	7	6½	6½
Certain-Teed Products Corp., pf.	102	96¾	96¾
Champion Paper & Fibre Co.	27	26½	26½
Champion Paper & Fibre Co., pf.	112½	111½	112
Congoleum Nairn Co.	26⅝	26	26⅜
Container Corp. of America	26	25⅜	25⅜
Continental-Diamond Fibre Co.	11⅞	11	11
Crown-Zellerbach Co.	19¼	18⅜	18¾
Crown-Zellerbach Co., pf.	103	103	103
Dixie Cup Co.	17⅝	17½	17½
Dixie Cup Co., —A.	47¾	46½	47
Flintkote Co.	24½	23½	23½
Flintkote Co., pf.	107½	107½	107½
Robert Gair	4¾	4¼	4⅜
Robert Gair, pf.	16⅝	16½	16½
International Paper Co.	20	18¼	18⅞
International Paper Co., pf.	83	81⅜	81¾
Johns-Manville Corp.	97½	96	97
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	40½	40	40
MacAndrews & Forbes	29½	29½	29½
MacAndrews & Forbes, pf.	...	...	...
Masonite Corp.	45⅜	44	44⅛
Mead Corp.	11¼	10⅞	10⅞
Mead Corp., pf. A-6%	95	95	95
Mead Corp., pf. B-5½%	87	85	87
National Container Corp.	22	21	21¼
Paraffine Companies Inc.	52½	52½	52½
Paraffine Companies, Inc., pf.	106	106	106
Rayonier, Inc.	15⅞	15⅜	15⅜
Rayonier, Inc., pf.	32⅝	32	32
Ruberoid Co.	32⅞	32¼	32¼
Scott Paper Co.	42¼	42¼	42¼
Scott Paper Co., pf.	109	109	109
Sutherland Paper Co.	33½	33	33½
Union Bag & Paper Corp.	12¼	11⅝	11¾
United Paperboard Co.	6	5⅞	5⅞
U. S. Gypsum Co.	79½	77⅜	77⅜
U. S. Gypsum Co., pf.	180	180	180
West Virginia Pulp & Paper Co.	25½	24⅜	24½
West Virginia Pulp & Paper Co., pf.	107¾	105½	107¾

BONDS

Abitibi Pulp & Paper Co. 5s '53	120	119⅜	119⅜
Celotex Corp. 3¾s '55	...	...	...
Certain-Teed Products Corp. 5½s '48	101¾	101¾	101¾
Champion Paper & Fibre Co. 4¾s '50	...	...	...
International Paper Co. 6s '55	107⅞	107⅝	107⅝
International Paper Co. 5s '47	105	104	104
Mead Corp. 3½s '53	...	...	...
West Virginia Pulp & Paper Co. 3s '54	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending August 5, 1944

STOCKS

	High	Low	Last
Great Northern Paper Co.	35	34¾	34¾
Hummel-Ross Fibre Corp.	6½	6⅜	6⅜
St. Regis Paper Co.	6	5½	5½
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	5⅜	5⅜	5⅜

BONDS

American Writing Paper Co. 6s '51	...	...	...

Abitibi Securities Show Strength

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., August 5, 1944—Junior securities of Abitibi Power and Paper Company, Ltd., continue to show growing optimism that some sort of capital rearrangement can be worked out and the company removed from receivership as a result of negotiations now actively under way. Junior securities recently hit new seven-year highs. Representatives of these securities have been meeting with the Hughes Committee (appointed some time ago by the Ontario Government) once a week during the past month, and the meetings continue. It is confidently expected by many of those immediately interested that final arrangements can be reached.

One plan that has been receiving particular attention is said to provide for exchange of new preferred stock, plus some common, for present preferred, and exchange of new common for present common on a one new for two old basis. Bondholders would receive notes for back interest claims, on which tax would have to be paid, only on maturity—at which time tax rates may be lower than at present.

It is reported that some leading bondholders have agreed to drop their claim for interest on interest, and have shown increased willingness to reach a settlement on their claims—under pressure from the Ontario Government.

No proposal for 7% preferred stockholders has been announced yet.

Kimberly-Clark Earns $2.14

The Kimberly-Clark Corporation reports for the six months ended on June 30 a net profit of $1,346,110 after all charges, equal to $2.14 a common share. In the first half of last year the company cleared $1,044,690 or $1.53 a common share.

Net sales for the first six months rose up $31,301,494 from the $22,400,854 volume for the 1943 period, and the operating profit increased to $3,399,635 from $2,550,879.

Net profit for the June quarter amounted to $637,900 or $1 a common share, against $559,118 or 84 cents a common share for the corresponding three months of last year.

Figures for the 1944 periods include all of the ordnance production for 1943 and are therefore not comparable with the earnings reported for last year's period, the report says.

Blandy Joins Paper Concerns

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., August 7, 1944—Announcement is made here that Dallam E. Blandy has severed his connections with New York Power and Light Company in order to take an active part in conducting the business of the Blandy Paper Company, Center Falls, and the American Woodboard Company, Thomson. He is vice president of both concerns. He entered the navy as a lieutenant while serving with the power concern and has been stationed at New Caledonia. He is now in the naval reserve.

Frederick G. Marks Co. Formed

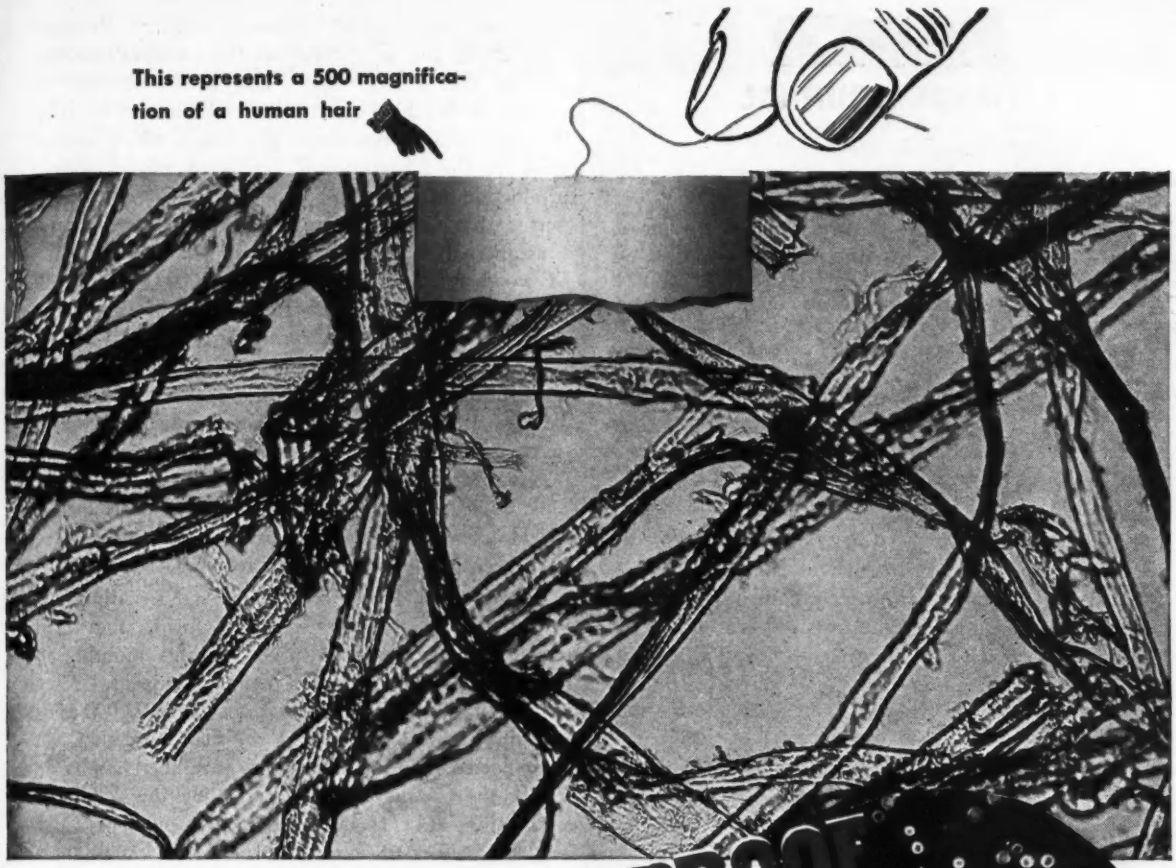
Frederick G. Marks Company is a new concern that has just been organized to deal in paper and twine with headquarters at 5 East 8th street, New York 3, N. Y. where the company will carry a various stock of wrapping paper, gum tape, twines, etc. The company will carry on a direct business from mill to consumer and mill to converter, the same as Frederick G. Marks, the head of the concern, has done in the past. Mr. Marks, who was formerly connected with the Richard Bauer Company, Inc., New York, is the sole owner of the new business.

A Correction

It was inadvertently stated in the heading of the financial report of the Minnesota and Ontario Paper Company, in the August 3 issue of the PAPER TRADE JOURNAL, that "M. & O. Earns 607.41." The correct sum was given in the text and the heading should have read: "M. & O. Earns $607,741."

Continental-Diamond Nets 38 Cents

The Continental-Diamond Fibre Company for the six months of 1944 reports a net profit, after provision for a renegotiation, of $173,688 or 38 cents a share, compared with $312,956 or 69 cents a share last year.



HERE'S VISUAL PROOF

The Paracol* Wax Emulsions virtually eliminate the danger of wax spots.

These actual photomicrographs (x500) of pulp fibers and of a Paracol emulsion show clearly their relative size, as well as the uniformity of the tiny wax particles. Hundreds of them would be needed to coat a single fiber . . . thousands of them to cover a human hair . . . many times more than that to form a wax spot.

The Paracols are everything that emulsions should be . . . uniform . . . stable . . . easy to use. And there are more than 50 different Paracols from which to choose the one best suited to your problem. For further information on the use of Paracols in your operations, mail the handy coupon.

HERCULES

CHEMICALS FOR INDUSTRY

August 10, 1944

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INCORPORATED
Paper Makers' Chemical Department
962 King Street
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Gentlemen:

My wax problem is.....

Please send me information on.....

Name.....Title.....

Firm.....

Address.....PI-46

*Reg. U. S. Pat. Office by Hercules Powder Company

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

CHICAGO PROFESSIONAL PAPER GROUP—First Monday of each month except July and August at Chicago, Ill.

NEWSPRINT SUPPLY DECLINES

Newsprint production in the United States declined slightly in June while Canadian output was slightly higher. North American production, reported by the News Print Service Bureau for June totaled 330,005 tons, of which Canada produced 246,846 tons, the United States 61,106 tons and Newfoundland 22,035 tons. North American mill stocks aggregated 130,956 tons, compared with 142,548 tons on June 30, 1943. Production of newsprint for the first five months of 1944 totaled 292,000 tons, compared with 345,000 tons for the like period in 1943, a decline of 15.2%. Imports aggregated 962,000 tons for the five month period, compared with 1,048,000 tons in 1943, a decline of 8.2%. Exports totaled 16,000 tons, compared with 15,000 tons in 1943, an increase of 2.8%. Total supply for the five months of 1944 was 1,239,000 tons, compared with 1,377,000 tons in 1943, a decline of 10.1%. Total inventories were 19.8% lower; publishers' stocks 18.0% lower and mill stocks 45.3% lower than in 1943.

In its current detailed report on the newsprint supply, the Department of Commerce states that the Wartime Prices and Trade Board of Canada has announced that production of 32-pound newsprint by Canadian mills for the United States market will be maintained during the third quarter at the same level as in the first six months. In view of this, the Department goes on to say, the Newspaper Industry Advisory Committee has recommended to the War Production Board that newspaper publishers be permitted to purchase for inventories as much Canadian newsprint as the mills in Canada can supply. This recommendation is made because consumption in the fourth quarter is high and the outlook for production in that quarter is uncertain. Output of 30-pound newsprint by Canadian mills appears uncertain at the present time. A Special Committee of United States publishers was appointed by the WPB June 15 to meet with Canadian authorities and newsprint manufacturers for the purpose of thoroughly examining the supply situation as affected by the manufacture of both 30-pound and 32-pound paper. The committee met in Montreal June 20-22 and as a result of their findings recommended that WPB request Canadian authorities to restore in the third quarter the commitment of 200,000 tons of 32-pound paper per month which existed prior to the experimental period of mixed weight production in May and June. The Committee reported that Canadian production for United States consumers has been based on an estimated supply of wood sufficient to produce 192,000 tons of 32-pound paper per month. By the use of fillers and a reduction of the sulphite content, this wood supply has been stretched sufficiently to permit a monthly production of 200,000 tons of 32-pound paper since January 1, 1944. Canadian manufacturers predicted that the manufacture of 30-pound paper would result in a decrease in yardage as well as tonnage. Canadian mills have been producing 30-pound newsprint during May and June, and the tonnage losses anticipated have been borne out in manufacturing experience.

Canadian producers have expressed a willingness to commit their mills to supply during the third quarter 190,000 tons of mixed weights monthly in place of 200,000 tons of 32-pound newsprint. They have at the same time pointed out that 192,000 tons monthly of mixed weights is the maximum that can be expected. In making their recommendations to WPB, the Committee was guided by the following alternatives: (1) If all United States publishers use 32-pound paper, there will be no reduction in their present tonnage quotas based on the Canadian commitment of 200,000 tons monthly. (2) If all United States publishers use 30-pound paper, there will be a reduction in the available tonnage, but an increase in yardage. In this event the Canadian commitment would be 190,000 tons per month for the third quarter (The present price differential is $4 per ton). (3) If United States publishers use both 30-pound and 32-pound paper, there will be a reduction in the available tonnage, but an increase in yardage for those who elect to order 30-pound paper. The Canadian commitment on this mixed basis would be 190,000 tons per month for the third quarter.

Alternative number 1 was recommended as most satisfactory in that it would permit a resumption of the 200,000 tons per month on which was based the reduction in consumption quotas of newspapers which became effective January 1, 1944. The Committee further recommended that effective July 1, 1944, Order L-240 be amended to establish a yardage measure to equalize the yardage differential between 30-pound and 32-pound paper, inasmuch as publishers may order, and manufacturers supply, either weight. An exception was recommended in the case of those publishers who ordered 30-pound paper within quota limitations for shipment in May and June, or prior to those months, but orders for 30-pound paper for July delivery be adjusted to compensate for the difference in yardage.

In reference to the price provision, through OPA Amendment No. 8 to MPR No. 130, extra light newsprint may be sold by producers at a price higher than the ceiling prices applying to 32-pound and 30-pound paper. Manufacturers are now making as light as 25 pounds per 500 sheets 24 by 36 inches, and this action was taken to compensate for the higher costs involved in manufacturing light weight papers. A differential of $4 per ton exists between the ceiling prices applying to standard 32-pound newsprint and 30-pound newsprint. It is based on the difference in cost producing the two weights. The price to consumers will be higher for light weight newsprint but a greater yardage permits larger printing surface. This new amendment became effective on July 1, 1944. The Department report indicates that newsprint granted on appeal in the second quarter totaled 8,479 tons, an increase of 1,418 tons over the first quarter, but 41,064 tons less than the tonnage granted during the second quarter of 1943. The estimated quarterly paper production and percentage of distribution by end user groups for newsprint, as compiled by the Department of Commerce is as follows for the third quarter of 1944: total authorized, 180,000 tons: Government 2.4%; defense plants, 0.10%; communications, etc. 89.1%; agricultural 0.02%; manufacturers of civilian products, 0.2%; retail and household, 0.15% and miscellaneous 9.0%.

To Return to Kimberly-Clark

The War Production Board announced recently in Washington, D. C., the resignation of Henry G. Boon as assistant director of its paper division. He will return to the Kimberly-Clark Corporation at Neenah, Wis.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1944		Corresponding Weeks—1943	
June 24	92.4	June 26	87.0
July 1	89.5	July 3	77.4
July 8 (Holiday July 4)	53.8	July 10	66.2
July 15	91.1	July 17	90.2
July 22	91.3	July 24	90.1
July 29	*92.7*	July 31	90.8

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1943	87.2	88.9	89.5	88.7	91.4	84.8	84.3	91.0	88.3	89.6	89.6	82.0	87.8
1944	89.6	89.6	90.1	89.5	90.9	92.6	*81.7*						

COMPARATIVE YEARLY SUMMARIES

	1937	1938	1939	1940	1941	1942	1943	1944
Year to Date....	87.8	67.9	78.6	86.9	93.6	95.2	87.8	*89.2*
Year Average ...	79.8	71.5	83.4	85.6	97.4	90.4	87.8	

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Avg.
1938..	56	63	63	60	60	59	59	69	70	73	67	61	64
1939..	65	73	76	74	69	73	68	77	82	91	88	77	77
1940..	78	75	74	76	82	85	77	79	78	85	83	77	78
1941..	81	88	89	89	91	94	92	98	95	99	98	90	92
1942..	102	101	101	95	82	72	68	75	76	81	82	77	84
1943..	86	88	94	94	96	94	89	96	94	94	93	87	93
1944..	90	96	95	96	96	96	*85*						

Week ending June 24, 1944—96
Week ending July 1, 1944—95
Week ending July 8, 1944—60
Week ending July 15, 1944—91
Week ending July 22, 1944—94
Week ending July 29, 1944—*96*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

PARSONS AND WHITTEMORE INCORPORATED
10 EAST 40TH ST.
NEW YORK CITY
•
WORLD-WIDE PAPER EXPORTERS

LYDDON & COMPANY (AMERICA) INC.
51 EAST 42ND ST.
NEW YORK CITY
•
EXPORTERS OF AMERICAN PULP TO BRITAIN, SOUTH AMERICA AND ALL OTHER WORLD MARKETS

*Trade-mark of American Cyanamid & Chemical Corporation applied to its synthetic resins for use by the paper industry.

The trade-mark PAREZ* has been chosen to designate all synthetic resins offered to the Paper Industry by the American Cyanamid & Chemical Corporation. This family of products includes our well-known wet strength resin derived from melamine. This same resin will henceforth be known as PAREZ 607.

Paper that is tough when either wet or dry, made possible by PAREZ 607, has become an important factor in the war effort. Some of the military uses outlined below may suggest a potential postwar product development to you.

MAPS printed on the new wet strength paper have been adopted as standard by many agencies making war maps. Their strength is retained even after being soaked with water or oil, or trampled in the mud, and then washed with soap and water or dipped in gasoline. They have satisfactory writing and erasing qualities even when wet.

WET STRENGTH PAPER FOR CLEANING MACHINERY is being used by the armed forces to extend the limited supply of rags.

WET STRENGTH PAPER FOR POLISHING LENSES of military optical instruments has proved valuable where ordinary papers might leave fibers that would interfere with clear vision.

PAPER BAGS, WATERPROOFED AND WET-STRENGTH TREATED, are in service which may be immersed in water or exposed to rain for extended periods of time and still protect vitally needed supplies being shipped to all parts of the globe.

WET STRENGTH BLUEPRINT AND PHOTOGRAPHIC PAPERS that are to be treated with sensitizing solutions are made more serviceable by application of wet strength resins.

FOOD PACKAGES of wet strength paper provide additional protection for moist foods such as meat.

WET STRENGTH TAGS on material and equipment going to our armed forces hold together even when exposed to water, expediting shipment and identif

From these examples it is easy to see PAREZ will have many new fields strength is of importance. Your ind war use of PAREZ will receive prom

Waxes • Rosin Size • Synthetic Resins
Casein • Alum • Corn Starch • Sul-phonated Oils • Fillers • Defoamers
Soda Ash • Caustic Soda • Salt Cake
Acids • Clays • Satin White • Wetting Agents • Calmicro (Calcium Carbonate) and other Paper Chemicals

American Cyanamid & Chemical Corporation

(A Unit of American Cyanamid Company)

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Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Esters of Certain Lignin Derivatives*

By Joseph C. Clark [1] and F. E. Brauns [2]

Abstract

A number of organic esters of alkali spruce lignin A, phenol spruce lignin A, and phenol Willstätter spruce lignin have been prepared. Various physical properties of these esters, including their solubilities in several organic solvents, have been determined.

Among the numerous attempts to utilize lignin are those which have been made by the plastic industry. Lignin itself, either in the form of acid lignin (obtained by means of strong mineral acid in the wood-saccharification process) or in the form of alkali lignin (obtained on acidification of black liquor from the soda pulping process), is a poor material for plastics, even in combination with other plastic bases. Lignosulphonic acid, as obtained from sulphite waste liquor, is not suitable for any kind of plastics because of the presence of a sulphonic acid group. Even when the sulphonic acid group has been removed, as is largely the case in the product obtained in the vanillin process, the resulting desulphonated lignin (which resembles, to some extent, a degraded alkali lignin) still shows poor, although somewhat improved, plastic properties, probably because of its lower melting point. In order to make it more suitable for plastics, Crepaz and Bertolini *(3)* converted the highly polymerized lignin of the wood-saccharification process into phenol lignin by condensing the lignin with phenol in the presence of a small amount of hydrochloric acid as a catalyst. They claimed that the phenol lignin is quite satisfactory as a plastic material, either by itself or in combination with other plastic bases.

One difficulty in the use of lignin in plastic materials is the presence of various types of hydroxyl groups which make the lignin a relatively hydrophilic compound. Even if, in the molding process, a certain number of hydroxyl groups is eliminated by condensation, there are still sufficient free groups available so that the final plastic has a high water absorption. In the condensation of lignin with formaldehyde, furfural, or similar compounds, the phenolic hydroxyl groups in the lignin may be covered. However, these constitute only a minor portion of the hydroxyl groups and the remaining alcoholic hydroxyl groups will still affect the water resistance of the plastic made from it. It is obvious that a decrease in the number of free hydroxyl groups should make the lignin less hydrophilic and, consequently, the plastic made from such a lignin should be more water resistant.

Esterification is the simplest and, therefore, the most common method for covering hydroxyl groups. Acylation of lignins from various sources and of lignin derivatives has been carried out principally for the determination of the number of hydroxyl groups. Although in most of these cases the lignin was acetylated, in a few cases the benzoyl or *p*-toluenesulphonyl derivative was prepared. In a recent paper, Brookbank, et al. *(1)* described the preparation of eighteen esters of monobasic aliphatic acids and of a few dibasic aliphatic acids of a commercial alkali lignin (Meadol). Of these esters, the stearoyl ester was found to be a good mold lubricant for various plastics. The marked solubility of this lignin stearate in organic solvents may make it suitable for use in ink and paint formulas. As was to be expected, molded wood plastic articles containing a small percentage of lignin stearate showed an improved water resistance.

The properties of some esters prepared from coniferous lignin isolated by the Klason method with 70% sulphuric acid were recently described by McNair and Jahn *(5)*. The organic esters, like the original lignin, were insoluble in the common solvents but condensed with phenol, aniline, and acetaldehyde. No loss of methoxyl was observed.

Because there are probably other possibilities for the use of lignin esters in industry, a number of esters of alkali lignin A, of phenol lignin A, and of phenol Willstätter lignin have been prepared to study their chemical and physical properties.

Preparation of the Lignins

Alkali spruce lignin A was prepared by acidifying a black liquor from a mild soda cook of spruce wood, previously extracted with alcohol and benzene; the crude alkali lignin was purified by precipitation of the dioxane solution into anhydrous ether (cf. Marshall, et al., *6)*. The alkali lignin A had a methoxyl content of 15.5%, or about 0.5% higher than that found by Marshall, probably because the crude alkali lignin was dissolved in a mixture of dioxane and methanol while it still contained some hydrochloric acid which might have caused the formation of some methanol alkali lignin.

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* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

A portion of a thesis submitted by J. C. Clark in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Master of Science from Lawrence College, Appleton, Wis., May, 1943.

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[2] Member TAPPI; Research Associate, The Institute of Paper Chemistry, Appleton, Wis.

Phenol spruce lignin A and phenol Willstätter spruce lignin were prepared by the directions of Buckland, et al. *(2)*. They had a methoxyl content of 10.5% and 11.9%, respectively.

Preparation of the Esters

The following esters were prepared:

- Alkali spruce lignin A
  - Acetyl
  - Undecanoyl
  - Benzoyl
  - *p*-Toluenesulphonyl
  - Phenylurethan
- Phenol spruce lignin A
  - Acetyl
  - Propionyl
  - Butyryl
  - Valeryl
  - Benzoyl
  - 3, 5-Dinitrobenzoyl
  - *p*-Toluenesulphonyl
  - Phenylurethan
- Phenol Willstätter lignin
  - Acetyl
  - Benzoyl
  - *p*-Toluenesulphonyl

Acylation Procedure

In general, the esters were prepared by the addition of 5.5 moles of acyl chloride to a cooled, well-stirred solution of 1 mole of lignin in about 25 moles of anhydrous pyridine (using 840 as the molecular weight of the alkali spruce lignin-building unit and 1220 as that of the phenol lignins). In the case of the acetyl derivatives, acetic anhydride was used instead of the acid chloride. The homogeneous reaction mixtures were allowed to warm up to room temperature and kept there for at least 24 hours. With the less reactive acyl chlorides, the reaction was carried out at 70 to 85° C. for 30 to 60 minutes. The reaction product was poured onto cracked ice and the crude acylated lignin derivative was filtered, thoroughly washed with distilled water, and dried in a desiccator over sodium hydroxide flakes and concentrated sulphuric acid. For purification, the crude dry ester was dissolved in ten times its weight of anhydrous dioxane and the ester was isolated by dropping the dioxane solution into anhydrous ether in which the excess acid is soluble, whereas the ester is more or less insoluble. In the case of the esters of the higher fatty acids, a mixture of ether and petroleum ether or even petroleum ether alone was used as the precipitant. The precipitated lignin ester was washed twice with fresh anhydrous ether and twice with petroleum ether and dried in a desiccator over concentrated sulphuric acid. The purfication was repeated until a constant methoxyl content was obtained.

Preparation of the Phenylurethans

Because neither alkali nor phenol lignin is soluble in phenyl isocyanate, they were dissolved in the minimum amount of dioxane and an excess of phenyl isocyanate to obtain a homogeneous solution. The mixture was then refluxed for 1 hour, some dioxane was distilled off, more phenyl isocyanate was added, and the mixture was heated for about 6 hours at 125 to 130° C. This treatment was repeated until a constant methoxyl content was reached. The phenylurethan was then isolated by diluting the mixture with dioxane and dropping the solution into well-stirred anhydrous ether. The products were purified in a way similar to that used for the esters until a constant methoxyl value was obtained.

The carbon, hydrogen, and methoxyl contents of the lignin esters are given in Tables I, II, and III.

TABLE I.—ESTERS OF ALKALI SPRUCE LIGNIN A

Ester	Carbon %	Hydrogen %	Methoxyl %	Number of Acyl Groups Calculated from the MeO	Theoretical MeO Calculated for the Entrance of 4 Acyl Groups	Theoretical MeO Calculated for the Entrance of 5 Acyl Groups
Original lignin ..	64.82	5.82	15.5	...	...	...
Acetyl	64.76	5.58	12.7	4.2	12.8	12.3
Undecanoyl	....	...	8.6	3.8	8.4	7.4
Benzoyl	71.47	4.97	9.3	5.1	10.2	9.4
p-Toluenesulphonyl.	60.87	5.00	8.4	4.4	8.7	7.9
			9.0(a)	4.0(b)	8.8(c)	9.7(c)
Phenylurethan ...	68.06	5.18	9.55	4.2	9.7	8.9
			4.8(d)	...	4.4(e)	5.0(e)

(a) Percentage sulphur found.
(b) Calculated on the basis of sulphur found.
(c) Theoretical sulphur content calculated for 4 and 5 acyl groups, respectively.
(d) Percentage nitrogen found.
(e) Theoretical nitrogen content calculated for 4 and 5 urethan groups, respectively.

TABLE II.—ESTERS OF PHENOL SPRUCE LIGNIN A

Ester	Carbon %	Hydrogen %	Methoxyl %	Number of Acyl Groups Calculated from the MeO	Theoretical MeO Calculated for the Entrance of 7 Acyl Groups	Theoretical MeO Calculated for the Entrance of 8 Acyl Groups
Original lignin ..	67.24	5.88	10.6	...	...	...
Acetyl	66.63	5.58	8.3	7.2	8.4	8.1
Propionyl	68.07	6.19	7.7	7.5	7.8	7.6
Butyryl	69.56	6.64	7.25	7.4	7.4	7.1
Valeryl	70.81	7.10	6.2	9.6	7.0	6.7
Benzoyl	74.53	5.10	6.0	8.4	6.5	6.1
3, 5-Dinitrobenzoyl	54.87	3.25	4.7	7.8	5.3	4.5
			8.1(a)	8.0(b)	7.7(c)	8.1(c)
p-Toluenesulphonyl.	62.08	4.86	4.9	8.4	5.5	5.1
			10.55(d)	8.0(e)	9.9(f)	10.55(f)
Phenylurethan	69.35	5.13	5.85	7.9	6.1	5.8
			5.4(a)	7.8(b)	4.8(c)	5.2(c)

(a) Percentage nitrogen found.
(b) Calculated on the basis of nitrogen found.
(c) Theoretical nitrogen content calculated for 7 and 8 dinitrobenzoyl or urethan groups, respectively.
(d) Percentage sulphur found.
(e) Calculated on the basis of sulphur found.
(f) Theoretical sulphur content calculated for 7 and 8 acyl groups, respectively.

TABLE III.—ESTERS OF PHENOL WILLSTATTER SPRUCE LIGNIN

Ester	Carbon %	Hydrogen %	Methoxyl %	Number of Acyl Groups Calculated from the MeO	Theoretical MeO Calculated for the Entrance of 5 Acyl Groups	Theoretical MeO Calculated for the Entrance of 6 Acyl Groups
Original lignin ..	67.95	5.98	...	...	...	...
Acetyl	67.16	5.58	9.7	5.1	9.8	9.5
Benzoyl	74.75	5.04	7.3	6.1	7.8	7.4
p-Toluenesulphonyl.	62.35	4.91	6.4	5.7	6.8	6.2
			9.0(a)	5.2(b)	8.7(c)	9.6(c)

(a) Percentage sulphur found.
(b) Calculated from the sulphur content.
(c) Theoretical sulphur content calculated for 5 and 6 acyl groups, respectively.

Discussion

The data of Table I show that, in general, only 4 hydroxyl groups of alkali spruce lignin A are esterfied. The low molecular weight of the acetyl group has little effect upon the methoxyl content and, therefore, the difference of the methoxyl contents of a tetra- and a penta-acetyl ester is too small to distinguish between them. The acyl group with a higher molecular weight, however, affects the methoxyl content to a much greater extent. Of the 4 high molecular acyl esters, 3 form tetra-acyl esters; the benzoyl ester is a penta-benzoyl alkali lignin. No definite explanation can be given for this discrepancy. It should be mentioned that Freudenberg *(4)* was unable to obtain a completely toluenesulphonated lignin; he attributed this behavior to the size of the toluenesulphonyl group. This may hold also for the phenylurethan group and for the long chain undecanoyl group ($CH_3(CH_2)_9CO$). It is interesting, however, that in no case is an ester formed with more than 5

acyl groups per lignin-building unit. As native lignin forms a penta ester by acylation of 4 hydroxyl groups and an enolized carbonyl group, it would seem that, in the dissolution of the lignin in an alkali cook, no new hydroxyl groups are formed. However, it is possible, or even probable, that the carbonyl group of lignin is changed by the action of the alkali through condensation or polymerization, and that a new hydroxyl group is formed at another place, probably by the opening of a pyran or furan ring.

Columns 5 and 6 of Table II show that the differences in the calculated methoxyl contents of the hepta- and octa-acyl esters are all within the limits of experimental error (with the exception of the dinitrobenzoyl ester). These small differences are caused by the high molecular weight of the lignin, in conjunction with the entrance of a compound (phenol) which increases the hydroxyl content of the final lignin derivative but decreases the methoxyl content to about 66% of its original value. Although it is impossible to draw definite conclusions as to the number of acyl groups present in the low molecular weight aliphatic esters, the sulphur content of the *p*-toluenesulphonyl phenol spruce lignin A undoubtedly suggests the formation of an octa-acyl ester. The same is true for the dinitrobenzoyl ester, because the calculated methoxyl content (4.5%) of the octa-acyl ester is in much better agreement with the found methoxyl value (4.6%), than is the methoxyl content (5.3%) calculated for the hepta-acyl ester. The valeryl ester, for which over 9 acyl groups are calculated on the basis of its methoxyl content, was undoubtedly impure. Its relatively low melting point (85 to 90°) and its high solubility (even in petroleum ether) made the purification very difficult and the odor of the final product indicated that free valeric acid was retained by the product.

The few data on the esters of phenol Willstätter spruce lignin (Table III) do not allow any definite conclusion to be drawn as the number of hydroxyl groups esterfied. Although the theoretical methoxyl values calculated for the entrance of 5 and 6 acetyl and benzoyl groups, respectively, lie too close together, the number of acyl groups calculated on the basis of the methoxyl content is close to 5 and 6, respectively; whereas, for the toluenesulphonyl ester when calculated on the basis of the sulphur content, it is again closer to 5. More work, which is already in progress, has to be carried out. In no case, however, is an acyl ester of phenol Willstätter lignin obtained with more than 6 acyl groups. This is of interest when the number of hydroxyl groups capable of acylation is compared with that of phenol spruce lignin A. Phenol Willstätter spruce lignin differs in its preparation from phenol spruce lignin A in that the former is obtained by the action of phenol upon lignin previously isolated by the action of supersaturated hydrochloric acid upon spruce wood, whereas the latter is obtained by the action of phenol under the same conditions directly upon spruce wood. This would indicate that, during the isolation of the lignin by the Willstätter method, some hydroxyl groups are lost (probably through condensation and polymerization) and are not restored by the formation of the phenol condensation product. On the other hand, it is true that the methoxyl content (11.9%) of phenol Willstätter spruce lignin is about 1.4% higher than that of phenol spruce lignin (10.5%). This may result from a lower phenol content (3 molecules instead of 4) or from a higher methoxyl content of the Willstätter lignin, which is usually 15.5 to 16.0%, as compared with 14.8% for native lignin. The correct answer may be that, in the formation of Willstätter lignin, one hydroxyl group is lost by condensation of the lignin with itself and that this condensation causes the Willstätter lignin to react with 3 phenol molecules only (instead of 4), causing a further decrease of one hydroxyl group. Further experiments are in progress.

TABLE IV.—SOLUBILITIES OF ESTERS

Product	Benzene	Acetone	Ethanol*	Methanol*	Ether*	Dioxane	Petroleum Ether
Phenol Lignin A	0	3	0	0	0	3	0
Acetyl	3	3	0	0	0	3	0
Propionyl	3	3	2	2	2	3	0
Butyryl	3	3	2	2	3	3	1
Valeryl	3	3	2	2	3	3	2
Benzoyl	3	3	0	0	0	3	0
p-Toluenesulphonyl	2	3	0	0	0	3	0
3, 5-Dinitrobenzoyl	0	3	0	0	0	3	0
Phenylurethan	0	3	0	0	0	3	0
Alkali Lignin A	0	3	3	3	0	3	0
Acetyl	3	3	0	0	0	3	0
Benzoyl	3	3	0	0	0	3	0
p-Toluenesulphonyl	0-1	3	0	0	0	1	0
Phenylurethan	0	3	0	0	0	3	0
Phenol Willstätter lignin	0	3	0	0	0	3	0
Acetyl	3	3	0	0	0	3	0
Benzoyl	3	3	0	0	0	3	0
p-Toluenesulphonyl	1	3	0	0	0	2	0

3—Very soluble.
2—Soluble.
1—Very slightly soluble.
0—Insoluble.
*—Dry reagents.

Physical Properties

Solubility of the Esters in Organic Solvents

The solubilities of the esters in various solvents are listed in Table IV. It can be seen that acetone and dioxane are good solvents for the lignin esters, whereas most of the esters are insoluble in absolute methanol, ethanol, ether, and petroleum ether. However, with increasing chain length of the acyl groups, the solubility in the latter solvents increases.

TABLE V.—PHYSICAL PROPERTIES OF ESTERS

Product	Color	Melting Range, °C.
Phenol Lignin A	light brown	
Acetyl	cream	146-179
Propionyl	cream	136-158
Butyryl	light brown	119-145
Valeryl	orange brown	85-98
Benzoyl	cream	169-205
p-Toluenesulphonyl	very light brown	143-167
Phenylurethan	cream	173-200
3, 5-Dinitrobenzoyl	very light brown	185-220
Alkali Lignin A		
Acetyl	very light brown	164-183
Benzoyl	very light brown	169-202
p-Toluenesulphonyl	very light brown	158-192
Phenylurethan	light brown	179-204
Undecanoyl	brown	121-140
Phenol Willstätter Lignin	purple brown	
Acetyl	very light brown	160-184
Benzoyl	very light brown	168-191
p-Toluenesulphonyl	tan	159-185

Other Physical Properties

The color and the melting range of esters are given in Table V. Products such as lignin esters, which are amorphous, do not have sharp melting points; hence, a melting point is of no value for determining the purity of the product as in the case of crystalline compounds. However, in order to obtain a general idea as to the behavior of the esters on heating, the melting range—that is, the temperature at which the product softens, shrinks, and darkens in color, and finally flows—was determined and recorded in Table V.

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Almon G. Harvey Goes With General Mills

A. D. Hyde, vice president of General Mills in charge of research, has announced the appointment of Almon G. Hovey as executive in charge of the New Chemicals Development Section of the company's research laboratories.

Mr. Hovey joins the General Mills staff with a background of 20 years experience in the field of synthetic resins. During this time, with the exception of one year with the Remington Arms Company of Bridgeport, Conn., where he did analytical testing and development work on raw materials, his entire attention has been directed toward the many phases of this field, including research, development, production, servicing, advertising, and patents. This work with resinous and other chemical products has taken him into a number of allied fields, including paint, varnishes, and lacquers, printing ink, floor covering, rubber, paper, textiles, plastics, and adhesives.

Mr. Hovey is a graduate of Dartmouth College and holds a Master's Degree from Union College. He was previously associated with the General Electric Company in Schenectady, N. Y., for a period of nine years beginning in 1924, where he was engaged in research on insulation, resins, coating materials, plastics and adhesives, and while there was one of the pioneers in the development of the concept of functionality, now widely accepted in theories of resin formation. In 1933 he became director of research for Beck, Koller, & Co., Inc., of Detroit, Mich., synthetic resin manufacturers, which later became the Reichhold Chemicals, Inc. For the past year, he has been in charge of the patent division in addition to the coating resin division of the organization.

Employs 45% of Town's Workers

Forty-five per cent of all the industrially employed persons in Menasha, Wis., are working for the Menasha Products Division of the Marathon Corporation, Leo E. Croy, vice-president of the corporation, said in an address Wednesday, July 26, at the noon meeting of the Menasha Rotary Club.

He said Marathon employs 1,361 persons at Menasha, and 60% of them live in Menasha; 26% in Neenah; 11% in Appleton, and 3% in neighboring towns. The company's employment and payrolls have trended upward the last 12 years, he stated.

Marathon's plans for the construction of a modern sulphate pulp mill in Ontario, Canada, were discussed. Mr. Croy said that work is underway and probably will be completed early in 1946. The mill will have a capacity of 250 tons of pulp daily.

Menasha Products receives nine cars of raw material daily, and ships 13 cars of finished products daily from Menasha. The company purchases $575,000 of goods annually from Menasha and Neenah firms, he said.

To Be Manager of Applied Engineering

The Reliance Electric and Engineering Company, Cleveland, as part of its preparations for postwar, is establishing a Sales Promotion Department, it is announced today by James W. Corey, sales vice president.

Effective August 1, Roscoe H. Smith, who has been manager of applied engineering for the company, will head up the new department, assisted by Kenneth F. Ertell, who has been named assistant advertising manager.

Under the enlarged set-up, C. V. Putnam relinquishes his duties as advertising manager to Mr. Smith but will continue his executive responsibilities as secretary of the company.

Richard A. Geuder, who has been manager of Metal Industry Applications, will assume Mr. Smith's

ROSCOE H. SMITH

previous responsibilities as manager of Applied Engineering, without, however, abandoning altogether his specialization in motor drive problems of the metal industry. He will be assisted by John L. Van Nort, until recently sales and application engineer for Reliance in Salt Lake City, and William C. Madsen, who has been on the company's application engineering staff for the past three years.

Paul W. Arnold, manager of Machinery Design Applications, continues in that capacity.

Mr. Smith attended the U. S. Naval Academy and the Massachusetts Institute of Technology. He graduated from the latter in 1923 with a degree of S.B. in Electrochemical Engineering, and immediately joined Reliance in Cleveland.

Subsequently he was assigned to sales offices in Chicago and in Boston, returning to Cleveland early in 1932 to devote all of his time to application engineering for the company.

Mr. Geuder obtained his B.S. in Electrochemical Engineering from Pennsylvania State College in 1929 and has been engaged in application engineering work for Reliance since that time.

Mr. Arnold graduated in Mechanical Engineering from the University of Michigan in 1927. Like Messrs. Smith and Geuder he came directly into application engineering work with Reliance following graduation from college.

Annual Report of the Committee on Research Appropriations*

By John L. Parsons [1]

During the past year (1943) no application for funds to aid in the carrying out of committee projects has been made, although an inquiry concerning the use of Association funds for committee work was sent in by the Water Committee. The lack of use of research funds can be traced to the marked reduction in the number of active committee projects on account of the war effort. This condition is likely to continue for the duration of the war period.

It has been necessary to terminate a project of the Fundamental Research Committee that has been under investigation at the Massachusetts Institute of Technology. Dr. Clifford B. Purves, under whom this project on the oxidation of cellulose was being conducted, has recently replaced Dr. Harold Hibbert as Professor of industrial and cellulose chemistry at McGill University. A progress report on this project was published in Technical Association Papers, volume 26, pages 119-124 (June, 1943). Dr. Purves has another report in preparation. Not all of the last research grant ($650) has been used and Dr. Purves has written that any unexpended amount will be returned to the Association. In his letter of October 27, 1943, Dr. Purves made the following significant statement: "I would like to express my very great appreciation of the encouragement and help your organization have given me these past years in this oxidized cellulose work. My feeling is that the results will provide valuable background for industry and for further research in the field."

A summary of all appropriations granted and reports published during the existence of the committee on research appropriations is found in the 1944 TAPPI Year Book, pages 62-65.

It is recommended that the Association should continue to make available research funds for projects of TAPPI committees.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

[1] Member TAPPI; Chairman, Research Appropriations Committee; Research Chemist, Hammermill Paper Co., Erie, Pa.

TAPPI Notes

Edwin H. Graves, formerly of the Halifax Paper Company, is now division engineer for the American Viscose Company, Roanoke, Va.

W. M. Hayes, formerly of the Rhinelander Paper Company, is now engineer for the Minnesota and Ontario Paper Company, International Falls, Minn.

Ralph Katzen, formerly of the Diamond Alkali Company, is now chemical engineer for the Vulcan Copper Supply Company, Cincinnati, Ohio.

Stephen I. Kukolich, formerly of the Neenah Paper Company, is now research chemist for the Lee Paper Company, Vicksburg, Mich.

Edward N. Poor, formerly of W. C. Hamilton & Sons, is now in the Technical Service Division of the American Cyanamid and Chemical Corporation, Stamford, Conn.

L. E. Russell of the Mathieson Alkali Works, Inc., has been transferred from Chicago to Niagara Falls, N. Y.

The TAPPI Pacific Section will hold three meetings during the coming year. On November 14, 1944 it will meet at Camas, Wash., on March 20, 1945, at Bellingham, Wash., when the new alcohol plant of the Puget Sound Pulp and Timber Company will be inspected. The annual meeting will be held in June, jointly with the Superintendents Association. Harold Bialkowsky of the Pulp Division, Weyerhaeuser Timber Company, will have charge of meeting arrangements.

In the report on Developments in the Physical Testing of Paper during 1942-1943 which appeared in the PAPER TRADE JOURNAL of July 6, 1944, an error appears in the third sentence of the first paragraph on page 46. The latter part of this sentence should read "2 seconds to 30 minutes" instead of "2 to 30 seconds."

New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Reginald Ed. Charlton, special representative, Synvar Corporation, Wilmington, Del.

John H. Loomis, manager, Heller & Merz Department, Calco Chemical Division, American Cyanamid and Chemical Corporation, New York, N. Y.

Chester R. MacDonald, salesman, the Flintkote Company, New York, N. Y.

Isadore Newman, manager, Phil-Fibre Box Board Mills, Inc., Philadelphia, Pa.

William F. O'Neil, research engineer, the Celotex Corporation, Chicago, Ill.

Edward J. Schroer, chief chemist, Container Corporation of America, Cincinnati, Ohio, a 1936 graduate of the University of Cincinnati.

Arthur R. Sloman, senior research officer, Pulp and Paper Research Section, Associated Pulp and Paper Mills, Ltd., Burnie, Tasmania, Australia, a 1937 graduate of the University of Adelaide.

Irving J. Stafford, General Superintendent, Neenah Paper Company, Neenah, Wis., a 1914 graduate of Clarkson College of Technology.

Paul R. Wiley, assistant Director of Research, West Virginia Pulp and Paper Company, Charleston, S. C., a 1937 graduate of Harvard University.

Expands Mill at Hornefors

WASHINGTON, D. C., August 7, 1944—A prominent Swedish wall and fiber board manufacturer plans to expand the wall board mill at Hornefors to make possible a larger production of wall board, according to a report to the Department of Commerce. The project which, it is estimated, will be completed by the end of the summer will cost approximately 250,000 kr.

Blowpit Consistency Control*

A Review and Preliminary Investigation

By J. N. Swarr[1] and Robert D. Cowherd[1]

Abstract

A review of process variables and their application to the blowpit is herein discussed.

The development of an automatic control is traced, based on the electrical properties exhibited by the agitation system.

Actual test data is presented to correlate the various methods in use, with the exception of the ammeter floating control type.

The summary includes several design features that are important parts of blowpit construction and operation.

Before the control of any process can be discussed, the fundamentals of such a procedure should be reviewed.

The blowpit unit process is a continuous one due to the maintenance of a material balance between solid and liquid content by the control of the liquid addition under conditions of continuous flow from the process to the brown stock washers.

To apply an automatic control to such a process, an independent control variable or variables must be chosen that will be indicative of the chemical or physical condition of the material in the process. The problem resolves itself into controlling the solid content of the pulp supply to the washers. The impossibility of individually making determinations of actual consistency and subsequently adjusting a valve is apparent. It is therefore necessary to select a dependent variable; one whose measurement reflects the actual value of consistency itself, and does so in a direct and constant relationship.

Fortunately, the construction of a blowpit incorporates a set of motor driven agitator blades; consistency can therefore be reduced to a measured value through a series of dependent variables. These are: viscosity, hence shearing force on the agitator blades and hence power input, either reflected electrically in the motor or by some physical means.

To establish a control function, it is important that the so-called process lags be understood and determined. These are generally three in number: capacity, transfer, and velocity-distance lags.

The capacity lag is usually divided into two components: demand side and supply side capacity lags.

The demand capacity is the ability of a process to withstand a change in potential energy following the change of another variable effecting the process. It is the potential energy storage or fly wheel effect of the process that tends to resist external disturbances. A high demand capacity will tend to stabilize the potential of the system and as such is advantageous to most control functions.

On first analysis, one might think this factor was well established in a blowpit because of its large physical dimensions. When it is realized, however, that the dilution section of the equipment is in the lower conical portion between the liquor input bustle and the discharge line to the stock pump, the capacity lag is not too large considering the flow from the section to the washers.

Supply capacity lag and the resistance of a potential transfer barrier to the process may be grouped to form transfer lag. It may be considered as the resistance to flow of control potential between the supply and demand capacities. The supply capacity and resistance to potential transfer should be small for good control. In the present problem the valve should be close to the blowpit and not in a position where, even though the valve is shut, the pipe capacity downstream from this point is still delivering dilution liquor.

The velocity-distance lag, sometimes called a transportation lag, is the time required for a change to be reflected in the measuring device after the controlled potential is applied. This can be minimized by adequate agitation surface.

Types of Control

In view of the above, several different types of control that have played a part in the evolution of the one to be thoroughly discussed later are considered.

The first control utilizing the change of an electrical property with consistency was the ammeter. The manner in which this is applied is shown in Fig. 1. This consists of a means for converting the ampere flow in one leg of the three phase system into a direct current value, so that a sensitive milli-voltmeter could be used to detect fluctuations in the a.c. motor circuit due to consistency changes. For an induction motor, this amperage value is by no means a straight line function against load. However, its variation with stock consistency was adequate for control purposes. The "LOW-OFF-HIGH" contacts associated with the controller, operate a motorized valve through an intermittent contactor whose make and break time is adjustable from 1 to 15 seconds.

The type of control obtained here is floating with a dead neutral. As the high contact closes, the motor valve runs toward its open position. At the neutral or off contact, the motor circuit is de-energized and the valve remains at the point where the power supply

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

[1] Engineer, The Bristol Co., Waterbury, Conn.

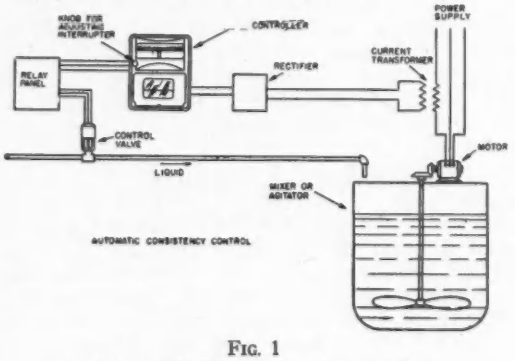

FIG. 1
Consistency Control Utilizing an Ammeter System

was opened. As the low contact is made, the motor is again energized and runs toward the shut position. The above action is inherently of a cycling nature and with any load change, transfer, or velocity-distance lags present, this action becomes so objectionable that manual operation is preferable.

Realizing the difficulties encountered in the above control, the next advancement in the solution of this problem was made.

In view of the induction motor power factor and current irregularities, it would be well to use as a dependent variable, the actual power input to the system in the form of a k.w. meter. Here current and power factor are both combined to give a complete picture of the motor operation. The use of pneumatic control mechanisms instead of electrical was thought advisable due to their more versatile combinations.

The dependent variable of liquor flow is the most important portion of this control problem. This can be explained as follows: There are two factors which work to change the rate of flow of dilution liquor through the control valve with a given setting. The rate of flow through a V port valve is approximately proportional to the square root of the differential pressure across the valve. Therefore, with a given valve setting, the actual flow through the valve will vary with:

1. Variations in upstream pressure.
2. Variations in downstream pressure.

The upstream pressure varies with the level in the black liquor storage tank. This varies rather slowly and does not make the control problem difficult. The downstream pressure, however, is essentially equal to the head of pulp in the blowpit. With a full blowpit, this head will be about 45 feet. The minimum level will be a foot or two above the liquor inlet lines. Assume the stock level to have dropped to within 5 feet of the liquor inlet lines and a digester to have blown, which, in a space of a few minutes, will raise this level to 20 feet above the liquor lines. This will increase the back pressure on the valve by about 300%, which will decrease the differential pressure across the valve by 300%, which will reduce the flow through the valve to about 60%. If two digesters are blown at once or consecutively, the flow through the valves will drop to about 40%.

It is obvious that if the dilution liquor flow is suddenly reduced by 30, 40, or even 5%, that high consistency stock is the result. Either one or all of the following may occur: 1. Shear off the agitator blade, 2. Kick out the agitator motor, 3. Plug the stock lines, 4. Plug the stock pump.

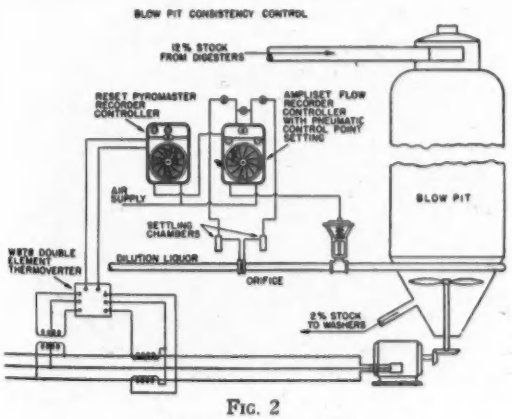

FIG. 2
Flow Control Installation

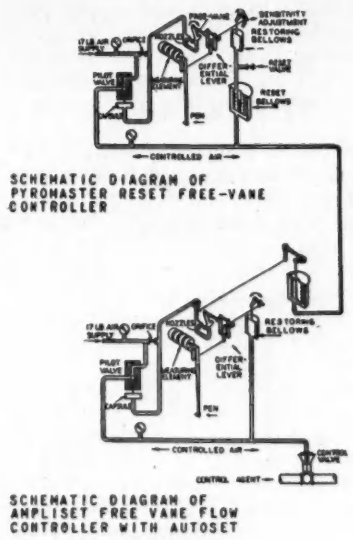
SCHEMATIC DIAGRAM OF PYROMASTER RESET FREE-VANE CONTROLLER
SCHEMATIC DIAGRAM OF AMPLISET FREE VANE FLOW CONTROLLER WITH AUTOSET

FIG. 3
Schematic Diagram of Control System

From the above, it is plain that there will be a greater variation in consistency because of changes in the rate of flow of the dilution liquor than from any other cause such as variations in stock from the digesters. Therefore, it is more important to control this load than any other factor. In other words, if stock from the digesters at 12%, is to be drawn off at a constant rate, to obtain uniform consistency, the flow of dilution liquor at a constant value must first be controlled regardless of variations in upstream and downstream pressure across the valve.

Flow Controller

This is the function of the flow controller. As variations tend to occur in the rate of flow, this flow controller operates the synchro valve to hold the flow constant and as long as the stock from the digesters is constant it will maintain a constant consistency.

Also incorporated is a type of control which the Bristol Company calls "Autoset" and has been defined as when the measured condition of medium A selects a point of control in medium B with the objective of maintaining a fixed value of medium A. Incorporated in the flowmeter is a bellows pressure element which repositions the control point of the flowmeter in accordance with the air pressure supplied to it from the wattmeter. In the wattmeter, therefore, a change of controlled air pressure from 0 to 15 p.s.i. moves the control point of the flowmeter from 0 to full flow, with intermediate positions proportional to pressure. The valve in the dilution liquor line is operated by the resulting controlled air pressure from the flowmeter. The flow controller therefore prevents large fluctuations completely and is the essential element of the whole system. The wattmeter control is merely a super-refinement. The flow control removes the large variations and the wattmeter control removes the small ones.

The removal of emphasis from the electrical to the supply side of the process is the new and novel change in the solution of this problem. The above bears out the importance of transfer lag and particularly the supply lag portion. The next result of the

flow control is to place the supply potential at or near that which will be required to operate the process regardless of up or downstream conditions from the valve. In Fig. 2 and 3 show diagramatically the actual instrumentation and a schematic plan of the controls.

The wattmeter primary element is of the thermal conversion type and is placed in the circuit in the conventional manner as shown. In this case, a two element type is used for measurement in a three-phase system. There is developed at the output terminals of the thermal converter, a direct e.m.f. proportional to the power in the alternating system. In the two element thermal converter, this e.m.f. for the full scale deflection of 0 to 20 k.w. is 0 to 100 milli-volts d.c.

It is then only necessary to use a recording, controlling potentiometer with a range of 0 to 100 millivolts to record this power and accessory air control additions to control it. This potentiometer is the basic, self balancing, round chart "Pyromaster" form, which was described as a recording "bridge" *(1)*.

The wattmeter air control system employed is of the "Reset" type which is a combination of two types, namely, proportioning and floating. For a more complete discussion of this in both theory and practice, reference is made Peters and Olive *(2)* and Rhodes *(3)*. It may be said, however, that the advantages of such a combination is the lack of departure or droop due to load changes.

The recording controller is of the mercury manometer type, using as its primary measuring element, a stainless steel thin edge orifice plate.

The flowmeter air control system used is of the proportioning type. Incorporated in this flowmeter in addition to the above, is a bellows type pressure element linked to the control spotter. The pressure source for the operation of this element is supplied from the controlled air pressure originating in the wattmeter. The external connections will be more completely understood by again refering to Fig. 2. The controlled air pressure from the flow controller is piped to the diaphragm on the synchro valve in the dilution liquor line to the blowpit.

Control Performance

The conditions under which a test run was to be made are the following:

Conditions of maximum washing capacity would be imposed.

Digester production would be adjusted so that all blows would be received by one tank.

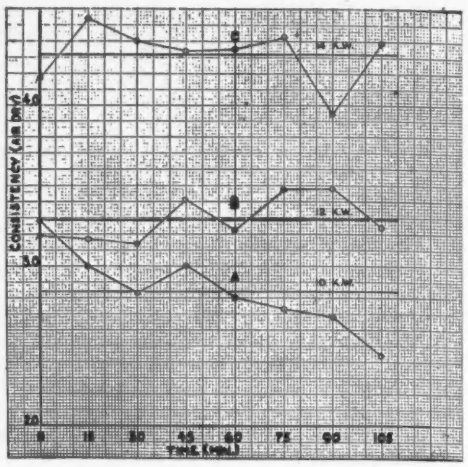

FIG. 5
Control of Consistency

The test period should be confined to the taking of eight samples at 15 minute intervals.

Sampling should be accomplished at a valve between the blowpit and the suction side of the stock pump to the washers. The difficulty of obtaining a representative sample at this point was because of the valve being installed in a line perpendicular to the pulp flow. This may introduce error. The fact remains, that if each sample be withdrawn in a like manner, the relative values obtained will be comparable.

Control point settings on the wattmeter, and hence consistencies, were to be made at 10, 12, and 14 k.w.

Chart records for the three control points are shown in Fig. 4. It will be noticed that test A at 10 k.w. control point, cycled continuously over a 1.2 k.w. range. The explanation for this can be seen from the same period on the flow chart No. 4. The valve, traveling to its maximum opening, could not obtain enough liquor to satisfy the control conditions. This being the lowest consistency, the liquor flow would be greatest. This fact also appeared at the dilution valve at the Oliver united washer, it being almost closed.

Refering to Chart 3, period B shows much more control action. Chart 4 gives the reason for this in that the valve had complete domination over the flow range necessary for the consistency at 12 k.w. The deviations from the control point shown here are due to sudden load changes imposed upon the blowpit in the form of stock valve opening for purging purposes. It should also be noted, that in each case the flow controller responded by opening the valve to a greater flow in order to catch this swing.

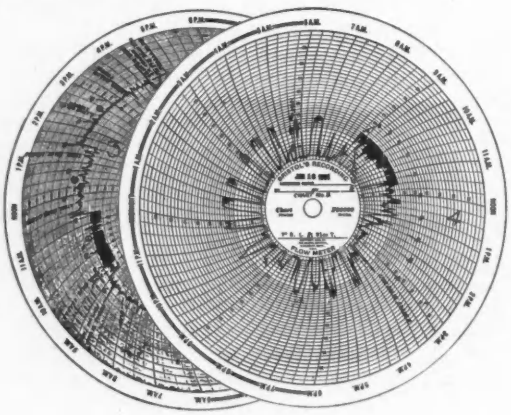

FIG. 4
Charts for the Three Control Points

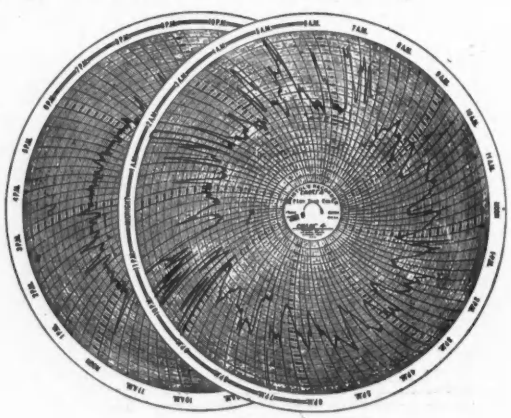

FIG. 6
Charts Showing Hand and Wattmeter Control

Charts 3 and 4 for period C gave the best control action at 14 k.w. consistency. Chart 4 shows that all times, the valve has complete domination of the control action. At 3:30 p.m. on Chart 3, a drastic stock valve opening will be noted, and the corresponding increase flow on Chart 4, with a subsequent leveling off to again pick up the control function.

On none of these records is there shown the evidence that digester "blows" had any effect on the blowpit operation. This proves conclusively that the instrumentation maintained the liquor flow at a constant value for all changes in downstream valve pressure.

Fig. 5 shows graphically the results of laboratory tests on the samples of pulp taken as described before. The consistency trend during the A period shows a marked tendency to wander, however, it will be remembered that during this interval, supply liquor was inadequate and as such this property may be explained. The trend during B period shows a marked improvement. Here the control valve could supply the required dilution to the system. Period C shows a better control trend than either A or B. Remember that during the latter portion of this period, a drastic stock valve change was made, therefore it may be assumed that this sampling was not representative of the control action.

A comparison of Charts 1 and 2 shown in Fig. 6 show marked differences in appearance. Chart 1 is a good example of hand control. The large fluctuations in k.w. readings and hence consistency, can only mean inefficient use and subsequent excessive evaporation of dilution liquor, reduced washing efficiency and the danger of shearing an agitator blade. All these add up to increased operating cost.

Chart 2 in Fig. 6 shows the control that may be expected when the wattmeter alone is used. Again large fluctuations occur, but not of the magnitude of those on Chart 1. The addition of air control to this portion of the instrumentation has eliminated the continuous cycling so evident in the floating control.

Chart 3 has been discussed, and of all the foregoing, it displays the most control domination and hence consistency regulation.

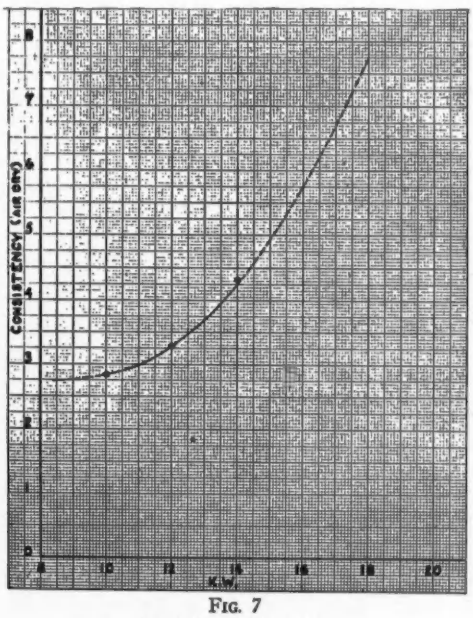

FIG. 7
Correlation of Chart Data

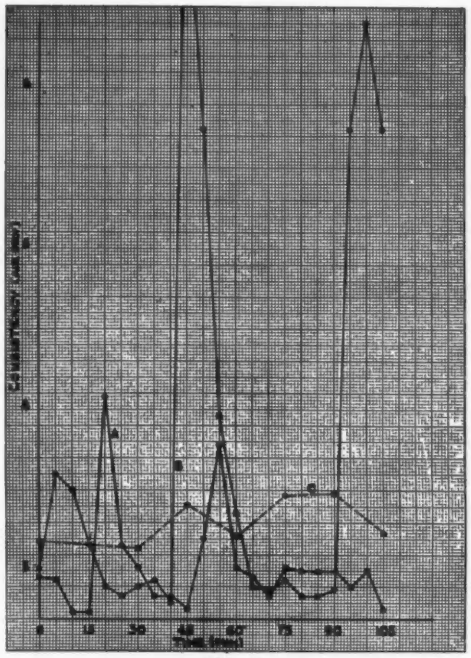

FIG. 8
Consistency Regulation Using Wattmeter (A), Hand (B), and a Combination Flow and Wattmeter Control (C)

Figure 7 is a k.w.-consistency curve that is admittedly to be an approximation due to its origin being based on three points of arithmetical average actual consistency and then grossly extrapolated to higher and lower values. Its object was to correlate all three charts on one plot. As such, this should not be construed as a curve for design or other use. It will show trends. The resulting curves are shown in Fig. 8. Curve A is that for wattmeter control; Curve B is for hand control, and Curve C is for the combination flow and wattmeter control. The graphic representation in this figure needs no discussion. It shows conclusively which operation gives the more uniform trend in consistency value.

Summary

In the summation the following points are important:

The control of consistency, both in the protection of equipment and operating economy, is an important factor in the blowpit unit continuous process.

Electrical or air types of floating control are not adequate for efficient blowpit operation.

The wattmeter method of consistency measurement is more reliable than that of the ammeter.

The wattmeter, incorporating "an air" control system, is a step in the right direction. The emphasis, however, should be placed on the addition of the flow controller as the prime requisite of the control of blowpit consistency.

"Blows" from the digester did not affect the operation of the flow-wattmeter control because its ability to offset this load change to the process.

An adequate supply of dilution liquor must be present if the controller is to have complete domination of the process at all times.

The control valve should be located as close to the dilution bustle as is feasable. This will decrease the transfer lag of the process.

In the design of pumping requirements in the dilution system, separate pumps should be used on the blowpit line and that supplying the washers.

The one factor that will throw a blowpit out of control and overload the agitator blade more than any other, is the indescriminate operation of the stock feed valve to the washers.

Curves showing the results of actual tests have been presented which show conclusively that when proper control equipment is applied, it is a valuable portion of the blowpit and washer equipment.

In conclusion, it may be said that the results of these tests are not satisfactory: not from the mechanism of the tests themselves, but from the possibilities of an additional air control feature and several other features that now seem feasable. It is therefore a distinct hope that future progress on the control of blowpit consistency can soon be reported.

Literature Cited

1. Inderdohnen, John F., Time-temperature control for sulphite digesters, *Tech. Asso. Papers* (1940).
2. Peters, J. C., and Olive, Theodore R., Measurement and control of process variables, fundamental principles of automatic control, *Chem. Met. Eng.* (May, 1943)
3. Rhodes, Thomas J. "Industrial Instruments for Measurement and Control," McGraw-Hill Book Company, Inc., New York, 1941.

Paper Testing Committee Report—1943*

By B. W. Scribner[1]

The following additional paper testing methods were completed and published during the year: T 460m-43, Air Permeability of Paper (Tentative Standard); T 461m-43, Flammability of Treated Paper and Paperboard (Suggested Method); T 462m-43, Printing Ink Permeation of Paper (Castor Oil Test) (Tentative Standard); T 463m-43, Adhesiveness of Gummed Paper Tape (Tentative Standard).

The methods for air permeability and flammability are based on methods developed by the A.S.T.M. Subcommittee I of Committee D-6. The method for printing ink permeation was developed with the cooperation of the TAPPI Graphic Arts Committee. This has since been revised, the principal change being specification of the temperature of the castor oil instead of the temperature of the box of the testing apparatus. The method for adhesiveness of gummed paper take has also been revised, the principal change in this being limitation of its scope as follows: "The results do not necessarily indicate how a given tape will behave when stuck to other surfaces than the kraft paper specified, nor how well it will maintain its adhesiveness over a period of time." A complete revision of the Tentative Standard T 437m-43, Dirt in Paper, was also published. The kerosene test contained in the Method T 427m-41, Saturating Properties of Roofing Felt was also revised, the vacuum method being substituted for the former procedure.

Changes were made relative to three methods for testing permeability to moisture as a result of further investigation of them at the National Bureau of Standards. The Suggested Method T 443sm-39, Water Permeability of Paper and Paper board (Ground-Glass Method), was withdrawn; the Procedure A in the Standard Method T 433m-41, Water Resistance of Paper (Dry-Indicator Method), was deleted from the method; and the Procedure B, the water method of the Standard Method T 448m-41, Water Vapor Permeability of Paper and Paperboard, was also deleted. These actions were taken because it was found that the testing procedures were not suitable for many of the present types of papers. Extensive further revisions of the last two methods are in progress for their further improvement. A separate method for testing water vapor permeability at high temperature and high humidity is being developed by a TAPPI special committee appointed for the purpose. A method of creasing paper for water vapor permeability tests is under development by the Paper Testing Committee. The procedure under consideration was developed at the Institute of Paper Chemistry. Its purpose is for the evaluation of the flexibility of paper and other sheet materials insofar as that property enters into the loss of the moisture protective quality of them during manufacture of bags and the wrapping of materials.

A revision of the standard method for bursting strength, T 403m-41, has been approved by the Paper Testing Committee and will be forwarded shortly for the consideration of the Standards Committee. The important changes in this were made to bring the description of the apparatus into accord with the present design of it.

In testing shipping tag stock, shipping sack paper, and high-grade wood and rag fiber papers at the National Bureau of Standards, relative to effect of treatments for high wet strength, it was found that fixing the time of immersion in water for wet tensile strength tests by use of the dry-indicator test as specified in the TAPPI method T 456m is unsatisfactory, as the paper is not completely saturated with water under this condition. It was found preferable to use a time of immersion such that the wet tensile strength is not decreased on a longer time of immersion. Also, in testing tissue for wet tensile strength, the use of the Finch attachment for the tensile testing apparatus was found superior to the procedure of the TAPPI method, as with the attachment the difficult handling of wet test strips is avoided. Revision of the TAPPI method in these respects is in progress.

A proposed method for measuring the curl of paper, based on research reported in National Bureau of Standards Research Paper RP1522, is being prepared for the consideration of the Paper Testing Committee.

Subcommittee development work in progress comprises development of a method for erasing quality under the chairmanship of P. W. Codwise, and a method for paraffin absorptiveness under the chairmanship of S. C. Fairbanks.

The total number of the TAPPI paper testing methods is now sixty.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

[1] Member TAPPI; Chairman, TAPPI Paper Testing Committee; Chief of Paper Section, National Bureau of Standards, Washington, D. C.

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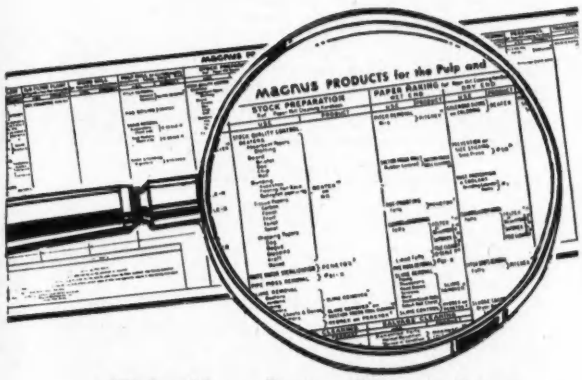

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New York Paper and Pulp Market Review

Less Wood Pulp For the Production of Paper For Civilian Use Appears Likely In Last Quarter—New Quota Ruling On Newsprint Is Announced — Waste Paper and All Rag Markets Active.

Office of the PAPER TRADE JOURNAL,
Wednesday, August 9, 1944.

The great utility of paper and paper products in both war and peace is exemplified by the current tight supply situation, due primarily to manpower shortage. The heavy requirements of the government for all purposes, is rather larger than was earlier estimated. Concern over the possible stricter allocation, priorated on essential end-uses, is reflected in reports received from manufacturers' representatives, jobbers, and general paper merchants this week. The prospect for less paper for civilian use continues unchanged by the current reports.

Production of all types of paper for June totaled 1,460,477 tons, compared with 1,416,114 tons in June 1943, reports the Department of Commerce. Increases in June 1944 over June 1943 were shown in writing, cover, bristols, bag and glassine papers. Less newsprint, printing, groundwood, specialties, book, other fine papers, wrapping and greaseproof papers were reported.

The index of general business activity for the week ended July 29 declined to 140.7, from 144.4 for the previous week, compared with 142.4 for the corresponding week last year. The index of paper board production was 155.4, compared with 149.8 for the previous week, and with 148.1 for the corresponding week in 1943.

Paper production for the week ended July 20 was estimated at 92.7%, compared with 90.8% for 1943, with 81.0% for 1942, with 100.5% for 1941, and with 87.4% for the corresponding week for 1940.

Paper board production for the week ended July 29 was 96.0%, compared with 97.0% for 1943, with 76.0% for 1942, with 92.0% for 1941, and with 74.0% for the corresponding week for 1940.

The new amendment (L-240), effective August 10, provides for computation of paper delivery quotas of newspaper publishers during the balance of this year, on an average monthly basis, permitting any publisher to order one-fifth of his total consumption quota for the last five months of 1944 from mills during these months.

Ceiling prices on sheathing paper, sold by producers east of the Rocky Mountains, was announced by OPA on August 8. Becoming effective on August 12, the action will, in general, cause no change in ceilings under GMPR.

Wood Pulp

The current pulp shortage, states the WPB, due to war and essential requirements and the labor shortage, has caused the special committee to revise its limitation orders as they affect the consuming industries, so that the aggregate right to buy and use paper will substantially balance the ability of the mills to produce it. In the fourth quarter, great quantities of pulp will go into the manufacture of fiber containers, waterproof papers, multiwall bags and special papers, and for military nitration pulp. This means that civilian paper supplies will have to be cut back, Rex W. Hovey said.

Rags

Demand for all grades of cotton cuttings is strong. Mill buying needs are quite widely reported as not being fully met, as supplies are inadequate to meet the heavy current demand. Prices are strong at ceiling levels.

Mill demand for old cotton rags is heavy in the roofing grades. All grades are bought freely. Prices are strong at ceiling levels.

Old Rope and Bagging

No important change in the old rope market has been reported this week. Demand for Manila fiber to meet essential war and industrial requirements continues in excess of limited supplies. Prices are at ceilings.

No improvement in the dull scrap bagging market has been reported at this date. Prices are soft and continue nominal.

Old Waste Paper

Mill demand for paper stock continues urgent and heavy. Some criticism has been directed at OPA Amendment No. 8 to Regulation No. 30, requiring bales of 500 pounds, rather than specifying baled paper in any weight bale, which would expedite the collection and shipment of baled paper stock to mills for repulping.

Waste paper prices are firm at ceilings.

Twine

Twine continues in active demand for all available grades. Prices are firm and no important change in the market has been reported during the current week.

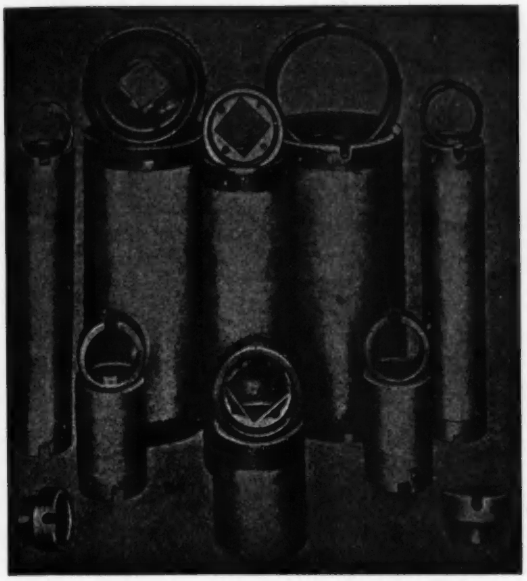
L. O. Koester Resigns

L. O. Koester has tendered his resignation as Vice President of the Ori Felt & Blanket Company, Piqua, Ohio, effective August 1, 1944. Mr. Koester had been active in the management and operation of the company since its inception in 1901, serving for many years as secretary and treasurer, and for the past ten years as vice president. He felt that he had now reached the point in life where he should be relieved of participating in the active management and therefore tendered his resignation as vice-president, which has been accepted by the board of directors.

The board has elected Mrs. Louise Orr Casparis to fill out the unexpired term as Vice President.

Pacific Mills Elect Officers

The annual meeting of the Pacific Mills Limited was held on July 25, and the following were elected as officers of the company: A. B. Martin, chairman of the board; P. E. Cooper, president; J. A. Young, vice-president and treasurer; H. C. Pim, vice-president, in charge of sales; J. H. Lawson, secretary, and A. A. McLennan, assistant treasurer and assistant secretary.



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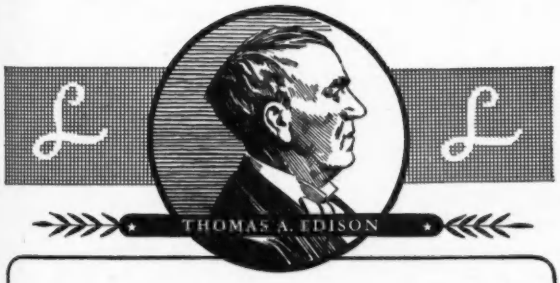

The chronicle of Yankee ingenuity would be woefully incomplete without mention of the Wizard of Menlo Park, whose epochal achievements in electricity need no embellishment here. Call it research if you like. Lindsay desires by sincere effort to contribute materially to the improvement of Fourdrinier wire cloth and of the paper that is made from it.

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, August 9, 1944.

BLANC FIXE—Prices on blanc fixe continue to conform to prevailing quotations. Demand is reported fair. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Demand is reported heavy. Production is heavy and the balance between supply and demand is reported good. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point.

CAUSTIC SODA—Demand very heavy. Deliveries are prompt. Market is tight. Prices unchanged. Solid and flake scarce. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported moderate on many grades of china clay. Quotations unchanged. Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand heavier with market reported a little tight at this date. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—The rosin market reports higher prices on some grades this week. "G" gum rosin is currently quoted at $5.61 per 100 pounds, in barrels, at Savannah. "FF" rosin is currently quoted at $5.54 per 100 pounds, in barrels, at New York. Seventy per cent gum rosin size is currently quoted at $5.88 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. Demand fair during the current week. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand for soda ash is reported to absorb current production. Shipments improved. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prospects of more corn are reported more favorable. Future supply situation is improved. Demand continues heavy and in excess of available supplies. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand good. Supply situation is reported satisfactory for the week. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.85 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR—Current consumption of sulphur continues heavy. Market situation unchanged. The quotation on annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported moderate. Domestic grades are currently quoted at from $16 to $21 per ton at works.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract...	*$58.00	@	—
Sheets	66.00	"	—
* OPA Maximum Price.			

Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping ....*	$5.25	@	—
No. 1 Wrapping... *	5.00	"	—
Standard Wrapping*	4.75	"	—
Standard Bag.....*	4.375	"	—
* OPA Manufacturers' Prices.			

Tissues—Per Ream—Carlots			
White No. 1.....	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½....	1.00	"	—
White No. 2.....	.90	"	—
Anti-Tarnish M.F..	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—

Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet....	5.70	"	—

Paper Towels, Per Case—			
Unbleached, Jr.....	2.20	"	—
Bleached, Jr.	3.20	"	—

Manila—per cwt.—C. l. f. a.			
No. 1 Jute.....11.25		@	—
No. 1 Manila Wrapping, 35 lb.....	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.....	5.75	"	6.00

Boards, per ton—			
News .....*	48.00	@	—
Chip .....*	48.00	"	—
Sgl. Mla. Ll. Chip*	60.00	"	—
White Pat. Coated*	75.00	"	—
Kraft Liners 50 lb.*	63.00	"	—
Binders Boards...	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10@$46.00		$40.25@$47.25
100% Rag	32.20 "	37.75	33.35 " 39.25
85% Rag	.... "	....	29.90 " 35.00
75% Rag	23.00 "	27.00	24.15 " 28.25
65% Rag	.... "	....	22.80 " 27.75
50% Rag	18.70 "	22.75	19.90 " 24.25
25% Rag	16.40 "	20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers
No. 1..	$10.55@$12.75		$11.70@$14.25
No. 2..	9.65 "	11.75	10.80 " 13.25
No. 3..	9.20 "	11.25	10.35 " 12.50
No. 4..	8.90 "	10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated...	$13.65	@	$15.50
No. 2 Glossy Coated...	12.40	"	14.00
No. 3 Glossy Coated...	11.60	"	13.25
No. 4 Glossy Coated...	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.....	9.35	"	10.75
A Grade S. & S. C...	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C. ..	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite.....	$86.00
Unbl. Softwood Sulphite.....	74.00
Bl. Hardwood Sulphite.....	83.50
Unbl. Hardwood Sulphite.....	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich ..72.00 @	82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate...	82.00
S. Semi Bleached Sulphate...	75.00
N. Unbl. Sulphate.....	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	72.00
Unbl. Soda	68.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area).....	10.50
West Coast (out area).....	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area).....	9.50
West Coast (out area).....	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1..	6.50	@	7.25*
Silesias No. 1.....	—	"	5.75*
New Unbleached...	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

Producers of

SULPHUR

Large stocks carried at all times, permitting prompt shipments . . . Uniformly high purity of 99½% or better . . . Free of arsenic, selenium and tellurium.

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York 17, N.Y.
Mine: Newgulf, Texas

THE HERMANN CLAFLIN
CONTINUOUS BEATER & REFINER
FOR
ECONOMICAL STOCK PREPARATION

—:—

Numerous installations have proved its ability to improve quality and with a substantial saving in power.

—:—

Adaptable for refining knots and screenings. Continuous and closed systems.

—:—

The Hermann Claflin is built in two sizes at the present time. Large capacity No. 3 ready in near future.

—:—

Operated at Conventional Jordan R.P.M.

—:—

THE HERMANN MANUFACTURING CO.
Also Mfg's. Sheet Making-Pulp Testing Apparatus
LANCASTER, OHIO

We Are Looking for Trouble

Often little things mean more work for the machine hand, the superintendent, or the purchasing agent. Does some little thing give trouble on your screens? Write us about it! Or ask to have a *UNION* representative call!

We may be able to help
and we'd sure be glad to try.

UNION SCREEN PLATE COMPANY
FITCHBURG, MASS.
(ASSOCIATED WITH UNION MACHINE CO.)

PRICE & PIERCE »»»»»»»»ltd•

Wood Pulp & Paper Agents

60 East 42 Street
New York, N. Y.

Old Rags

White, No. 1—
Repacked .....*3.80 " —
Miscellaneous ....*3.20 " —
White, No. 2—
Repacked .....*2.90 " —
Miscellaneous ....*2.65 " —
Third and Blues—
Repacked .....*2.20 " —
Miscellaneous ....*1.80 " —
Roofing Rags—
No. 1.....*1.55 " —
No. 2.....*1.45 " —
No. 3 (bagging)..*1.35 " —
No. 4.....*1.25 " —
No. 5A.....*1.35 " —
Old Manila Rope.. 5.75 " —
OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings.. 2.25 @ 2.40
New Mixed Cuttings. 2.00 " 2.20
New Light Silesias.. 5.50 " 5.75
Light Flannelettes... 5.50 " 5.75
New White Cuttings. 7.00 " 7.50
New Light Oxfords. 4.00 " 4.50
New Light Prints... 3.00 " 3.25

Old Rags

No. 1 White Linens. 7.50 " 8.50
No. 2 White Linens. 6.50 " 7.50
No. 3 White Linens. 4.50 " —
No. 4 White Linens. 2.25 " 3.25
No. 1 White Cotton. 4.25 " 4.75
No. 2 White Cotton. 3.25 " 3.75
No. 3 White Cotton. 2.50 " 3.00
No. 4 White Cotton. 1.90 " 2.20
Extra Light Prints.. 2.00 " 2.40
Ord. Light Prints... 1.75 " 2.15
Med. Light Prints... 1.55 " 1.95
Dutch Blue Cottons. 2.25 " 2.50
French Blue Linens. 3.00 " —
Checks and Blues... 2.00 " —
Linsey Garments.... 1.90 " 2.00
Dark Cottons..... 1.50 " 1.60
Old Shopperies..... 1.30 " 1.45
New Shopperies..... 1.45 " 1.50
French Blues..... 2.25 " 2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—
Foreign .....Nominal
Domestic ..... 4.25 @ 4.35
Wool Tares, light.... 4.25 " 4.50
Wool Tares heavy... 4.50 " 5.00
Bright Bagging..... 4.50 " 4.85
Manila Rope—
Foreign ..... — " —
Domestic .....*5.75 " —
Jute Threads..... 5.50 " —
No. 1 Sisal Strings..*4.00 " —
Mixed Strings..... 2.00 " —
* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)
OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut ..... 3.37½ @ —
No. 1 Hard White Envelope Cuts.... 3.12½" —
No. 1 Hard White Shavings, unruled. 2.87½" —
No. 1 Hard White Shavings, ruled... 2.50 " —
Soft White Shavings, one cut..... 2.87½" —
No. 1 Soft White Shavings ..... 2.50 " —
Soft White Shavings, Misc. ..... 2.15 " —
No. 1 Fly Leaf Shavings ..... 1.67½" —
No. 2 Fly Leaf Shavings ..... 1.12½" —
No. 1 Groundwood Fly Leaf Shavings 1.25 " —
No. 2 Mixed Groundwood Fly Leaf Shavings ..... .90 " —
Mixed Colored Shavings ..... .75 " —
Mixed Groundwood Colored Shavings.. .90 " —
Overissue Magazines ..... 1.67½" —
No. 1 Heavy Books & Magazines ..... 1.92½" —
Mixed Books..... 1.10 " —
No. 1 White Ledger.. 2.30 " —
No. 2 Mixed Ledger, colored ..... 2.00 " —
New Manila Envelope Cuttings, one cut.. 2.87½" —
New Manila Envelope Cuttings ..... 2.65 " —
Extra Manilas..... 1.95 " —
Mixed Kraft, Env. & Bag Cuttings..... 2.75 " —
Kraft Envelope Cuttings ..... 3.25 " —
Triple Sorted, No. 1 Brown Soft Kraft. 2.50 " —
New 100% Kraft Corrugated Cuttings.. 2.25 " —
No. 1 Assorted Old Kraft ..... 1.75 " —
New Jute Corrugated Cuttings ..... .90 " —
Old 100% Kraft Corrugated Containers 1.75 " —
Old Corrugated Containers ..... 1.40 " —
Box Board Cuttings. .72½" —
White Blank News.. 1.65 " —
Overissue News..... 1.10 " —
No. 1 News..... 1.00 " —
No. 1 Mixed Paper... .95 " —
Old Corrugated Containers ..... .82½" —
Mill Wrappers..... 1.10 " —

Twines

All Prices Nominal
(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—
India ..... .21 @ —
White Hemp..... .21 " —
Fine Polished—
Fine India..... .26 " —
Unpolished—
Box ..... .17½" —
Paper Makers..... .17 " —
Tube Rope..... .19 " —
Wall Paper..... .20½" —
Wrapping ..... .23 " —
Soft Fiber Rope... .19 " —
Cotton ..... .25 " —
(Hard Fiber)
Medium Java..... .18 " —
Mex. Sisal..... .16 " —
Manila ..... — " —

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—
New White No. 1..... .07¼
New White No. 2..... .05¾
Light Silesias..... .05¾
Black Silesias, soft..... .03¾
New Unbleached ..... .07½
Washable Prints ..... .04¼
Washable No. 1..... .03
Blue Overall..... .05½
Cottons—According to grades—
Washable shredding ..... .01¾
Fancy Percales ..... .04¾
New Black Soft ..... .03¼
Khaki Cuttings—
Unbleachable Cotton Cuttings .03½
Bleachable Cotton Cuttings.. .04¼
Men's Corduroy ..... .03½
Ladies' Corduroy ..... .03
Cottonades ..... .03¼

Domestic Rags (Old)

White No. 1—Repacked ..... 3.80 " —
Miscellaneous No. 1. 3.20 " —
Miscellaneous No. 2. 2.65 " —
White No. 2—Repacked ..... 2.90 " —
Thirds and Blues—
Miscellaneous .... 1.80 " —
Repacked ..... 2.20 " —
Black Stockings—
(Export) .....Nominal
Roofing Stock—
Foreign No. 1....Nominal
Domestic No. 1... 1.55 " —
Domestic No. 2... 1.45 " —
Roofing Bagging.. 1.35 " —
Old Manila Rope... 5.75 " —

Bagging

(F. o. b. Phila.)

Gunny No. 1—
Foreign .....Nominal
Domestic ..... 3.00 " 3.50
No. 1 Clean bright—
Sisal Strings ..... .04
No. 2 Clean bright—
Sisal Strings ..... .03
Sisal Jute ..... .02½ " .02¾
Scrap—
No. 1..... .... 3.25 " 3.50
No. 2..... 1.75 " 1.80
Wool Tares hea ... 4.00 " 4.25
No. 1 New Light Burlap ..... 3.00 " 4.00
New Burlap Cuttings 3.75 " 4.00

Old Papers

(F. o. b. Phila)
OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut ..... 3.37½" —
No. 1 Hard White Shavings, unruled.. 2.87½" —
Soft White Shavings, one cut..... 2.50 " —
White Blank News.. 1.65 " —
Soft White Shavings, Misc. ..... 2.15 " —
No. 1 Fly Leaf Shavings ..... 1.67½" —
No. 2 Fly Leaf Shavings ..... 1.12½" —
No. 1 Groundwood Fly Leaf Shavings 1.25 " —
No. 2 Groundwood Fly Leaf Shavings .90 " —
Mixed Colored Shavings ..... .75 " —
New Manila Envelope Cuts, one cut..... 2.87½" —
Hard White Envelope Cuts, one cut..... 3.37½" —
Triple Sorted No. 1 Brown Soft Kraft. 2.50 " —
Mixed Kraft Env. & Bag Cuttings..... 2.75 " —
Kraft Envelope Cuttings ..... 3.25 " —
No. 1 Heavy Books & Magazines..... 1.92½" —
New Manila Envelope Cuts, one cut..... 2.87½" —
New Manila Envelope Cuttings ..... 2.65 " —
White and Colored Tabulating Cards.. 2.25 " —
Ground Wood Tabulating Cards ..... 1.35 " —
White Blank News.. 1.65 " —
No. 1 Assorted Old Kraft ..... 1.75 " —
No. 1 Mixed Paper... .95 " —
Overissue News..... 1.10 " —
Box Board Cuttings. .72½" —
New Corrugated Cuttings, Kraft..... 2.25 " —
Old 100% Kraft Corrugated Containers 1.75 " —
Old Corrugated Containers ..... 1.40 " —
Jute Corrugated Cuttings ..... 1.07½" —

Bagging

(F. o. b. Boston)

Gunny Bagging—
Foreign .....(nominal)
Domestic ..... — @ 2.75
Sisal Rope No. 1....*4.75 " —
Sisal Rope No. 2....*4.25 " —
Mixed Rope ..... — " 1.55
Transmission Rope—
Foreign .....(nominal)
Domestic ..... 2.75 " 3.00
Manila Rope—
Foreign .....(nominal)
Domestic ..... 5.75 " —
Soft Jute Rope..... 5.25 " —
Jute Cor Threads. 3.00 " 3.50
Bleachery Burlap.... 8.50 " 9.00
Scrap Burlap—
Foreign .....(nominal)
Domestic ..... — " 2.50
South American ... — " 3.00

BOSTON

Old Papers

(F. o. b. Boston)
OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled. 2.87½ @ —
No. 1 Hard White Shavings, ruled... 2.50 " —
Soft White Shavings, Misc. ..... 2.15 " —
No. 1 Fly Leaf Shavings ..... 1.67½" —
No. 2 Fly Leaf Shavings ..... 1.12½" —
No. 1 Groundwood Fly Leaf Shavings 1.25 " —
No. 2 Groundwood Fly Leaf Shavings .90 " —
Mixed Colored Shavings ..... .75 " —
New Manila Envelope Cuts, one cut..... 2.87½" —
Hard White Envelope Cuts, one cut..... 3.37½" —
Triple Sorted No. 1 Brown Soft Kraft. 2.50 " —
Mixed Kraft Env. & Bag Cuttings..... 2.75 " —
Kraft Envelope Cuttings ..... 3.25 " —
No. 1 Heavy Books & Magazines..... 1.92½" —
New Manila Envelope Cuts, one cut..... 2.87½" —
New Manila Envelope Cuttings ..... 2.65 " —
White and Colored Tabulating Cards.. 2.25 " —
Ground Wood Tabulating Cards ..... 1.35 " —
White Blank News.. 1.65 " —
No. 1 Assorted Old Kraft ..... 1.75 " —
No. 1 Mixed Paper... .95 " —
Overissue News..... 1.10 " —
Box Board Cuttings. .72½" —
New Corrugated Cuttings, Kraft..... 2.25 " —
Old 100% Kraft Corrugated Containers 1.75 " —
Old Corrugated Containers ..... 1.40 " —
Jute Corrugated Cuttings ..... 1.07½" —

Bagging

(F. o. b. Boston)

Gunny Bagging—
Foreign .....(nominal)
Domestic ..... — @ 2.75
Sisal Rope No. 1....*4.75 " —
Sisal Rope No. 2....*4.25 " —
Mixed Rope ..... — " 1.55
Transmission Rope—
Foreign .....(nominal)
Domestic ..... 2.75 " 3.00
Manila Rope—
Foreign .....(nominal)
Domestic ..... 5.75 " —
Soft Jute Rope..... 5.25 " —
Jute Cor Threads. 3.00 " 3.50
Bleachery Burlap.... 8.50 " 9.00
Scrap Burlap—
Foreign .....(nominal)
Domestic ..... — " 2.50
South American ... — " 3.00
Wool Tares—
Foreign .....(nominal)
Domestic ..... 4.25 " —
Aust. Wool Pouches.. — " 3.25
New Zealand Wool Pouches ..... — " 3.50
New Burlap Cuttings 4.75 " 5.00
Heavy Baling Bagging 4.00 " 4.25
Paper Mill Bagging.. 2.50 " 3.00
No. 2 Roofing Bagging 1.35 " —
* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—
New Light Prints. .04½ @ .04¾
Fancy Percales.... .04¼ " .05
New White No 1. .06¾" .07
New Light Flannelettes ..... .05½" .06
Canton Flannels, Bleached ..... .06 " .06½
Underwear Cutters, Bleached ..... .06¼" .06¾
Underwear Cutters, Unbleached ..... .05¾" .06
Silesias No. 1..... .06 " .06½
New Black Silesias.. .03 " .03½
Red Cotton Cuttings .03½" .04
Soft Unbleached ... .06½" .06¾
Blue Cheviots .... .05½" .06
Fancy ..... .02¾" —
Washable ..... .02¾" —
Khaki Cuttings .... .02¾" .03
O. D. Khaki..... .03½" .03¾
Corduroy ..... .03¾" .04¼
New Canvas ..... .06¼" .06½
B. V. D. Cuttings... .06¼" .06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—
Repacked ..... 3.80 @ —*
Miscellaneous .... 3.20 " —*
White No. 2—
Miscellaneous .... 2.65 " —*
Twos and Blues, Repacked ..... 2.20 " —*
Old Blue Overalls... 2.25 " 2.50
Thirds and Blues, Repacked ..... 2.20 " —*
Miscellaneous ..... 1.80 " —*
Black Stockings .... 3.50 " 4.00
Roofing Stock—
No. 1 ..... 1.55 " —*
No. 2 ..... 1.45 " —*
No. 3 ..... 1.35 " —*
No. 4 ..... 1.35 " —*
No. 5, Quality A.. 1.35 " —*
Quality B.. 1.20 " —*
Quality C.. .95 " —*
* Old Manila Rope.. 5.75 " —
* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas .....(nominal)
Dark Cottons .....(nominal)
Dutch Blues .....(nominal)
New Checks and Blues..(nominal)
Old Fustians .....(nominal)
Old Linsey Garments....(nominal)
New Silesias .....(nominal)
Misc. ..... 2.15 " —
No. 1 White Ledger.. 2.30 " —
No. 2 Ledger, colored 2.00 " —
No. 1 Heavy Books & Magazines..... 1.92½" —
Overissue Magazines. 1.67½" —
New Manila Envelope Cuttings ..... 2.65 " —
No. 1 Assorted Old Kraft ..... 1.75 " —
No. 1 Mixed Paper... .95 " —
Box Board Cuttings. .72½" —
Kraft Corrugated Cuttings ..... 2.25 " —
Old Corrugated Containers ..... 1.40 " —
Overissue News..... 1.00 " —
No. 1 News..... 1.00 " —

CHICAGO

Waste Paper

(F. o. b. Chicago)
OPA Maximum Prices, Baled

Shavings—
No. 1 Hard White Envelope Cuts, one cut ..... 1.37½" —
No. 1 Hard White Shavings, unruled. 2.87½" —
No. 1 Soft White Shavings ..... 2.50 " —
No. 1 White Ledger.. 2.30 " —
No. 1 Heavy Books & Magazines..... 1.92½" —
White Blank News.. 1.65 " —
Mixed Kraft Env. & Bag Cuttings... 2.75 " —
No. 1 Assorted Old Kraft ..... 1.75 " —
Overissue News..... 1.10 " —
No. 1 News..... 1.00 " —
No. 1 Mixed Paper... .95 " —
No. 1 Roofing Rags. 1.55 " —
No. 1 Roofing Bags. 1.45 " —